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# PUBLIC HEALTH REPORTS

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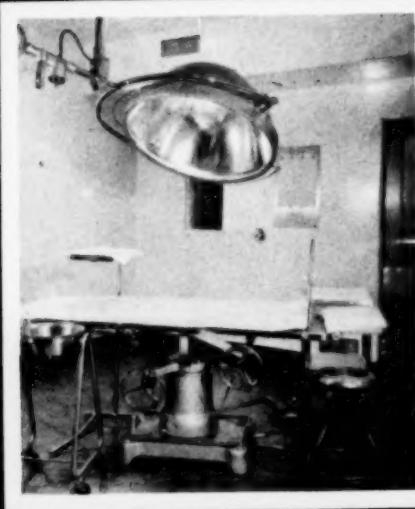
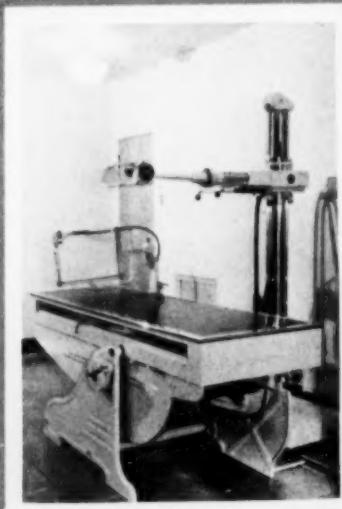
Scholarship Locations  
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Dental Care Study  
Information WHO



U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service

*Klickitat*  
*Valley*  
*General*  
*Hospital*

Goldendale, Washington



see overleaf

## PUBLIC HEALTH REPORTS

Published since 1878

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Klickitat Valley General Hospital (center) was opened in December 1949 at Goldendale, Wash. For adequate hospital care before then, patients crossed the Columbia River—on an unscheduled ferry—to The Dalles in Oregon or traveled to Yakima, 81 miles away. The community had no physician.

The new 23-bed hospital is the first hospital completed in Washington State under the Hospital Survey and Construction Act (Hill-Burton program). Shown here are some of its well-equipped facilities.

A darkroom is adjacent to the X-ray room (lower left). The surgery (lower right) and obstetrical room share a high-powered, explosion-proof ventilating system to carry off anesthetic gases. The cheerful furnishings in each patient room (lower center) and the reception room (upper right) were do-



*Goldendale's only hospital was this rented frame residence until 1949.*

nated by Goldendale citizens. The new plant has almost a quarter of an acre of floor space.

Since the completion of its modern hospital, two young general practitioners have moved to Goldendale. Specialists in orthopedic surgery, gynecology, and radiology now come regularly from Yakima, The Dalles, and Portland, Oreg. The hospital cooperates with the local health department in sponsoring chest clinics.

Immediate financial success has accompanied the improved hospital service. The first year of operation showed a net gain of \$1,516. Admissions for 1952 totaled 1,042 as contrasted with the 700 patients admitted during the last year of operation for the old hospital.

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# PUBLIC HEALTH REPORTS



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# Medical Education Scholarship Loans *in the* **Mississippi Integrated Health Program**

By **FELIX J. UNDERWOOD, M.D.**

**T**HREE ARE years in the life of a State, just as in the life of an individual, that mark a kind of coming of age. Such a year in the history of Mississippi was 1946. At that time nearly half a century of work on medical, hospital, and nursing problems culminated, and new surveys, studies, and plans were made that launched the State on a new medical era.

Among the programs inaugurated in 1946 was the medical education scholarship loan program, which is helping to meet one of Mississippi's greatest medical needs—that for general practitioners in rural areas. By January 1, 1953, 120 physicians who had been granted loans under the program were in practice in the State, representing almost one-third of the total increase in physicians since 1946. An additional 15 loan recipients were in the Armed Forces, and another 52 were serving their internships.

## **Background of the Integrated Program**

Mississippi is a rural State, with 70 percent of its people living in rural areas and securing

their incomes from farm production, and, although there is some trend toward urbanization, it can be expected to be one for some time to come. In a rural State personal income can be expected to be less than that in more urban States, and the population can be expected to be scattered rather than concentrated. Thus, the large cash outlays necessary for a medical education are frequently not available from family funds, and the scattered, isolated population creates special problems in providing adequate medical care.

In 1946, Mississippi was suffering along with the rest of the Nation from 5 years of war and 10 years of depression, which had left both material and personnel problems in medical care. Few hospitals, health departments, or clinics had been built; few doctors, nurses, or other medical personnel, trained. Inquiries and surveys by the Mississippi State Board of Health and other agencies interested in the medical problems of the State, including the State medical society, the business research station at Mississippi State College, and the Farm Bureau Federation, revealed the following conditions:

*Physicians.* The number of physicians in the State had decreased each year since 1909, from 2,054 in that year to 1,112 in 1946, while the population of the State had increased from 1,790,000 to 2,186,000. Actually, only 915 physicians were actively practicing in 1946. The number of persons per physician had increased from 871 in 1909 to 1,966 in 1946, whereas the national average had remained around 700 dur-

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*Dr. Underwood, executive officer of the Mississippi State Board of Health since 1924, is a member of the Mississippi State Medical Education Board. His career in public health and medicine has included the presidencies of the Southern Medical Association (1931), the State and Provincial Health Authorities (1939), and the American Public Health Association (1944).*

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ing the entire period. More than half of the physicians licensed to practice in the State were over 60 years old; only 139 were less than 40 years old.

*Medical and Nursing Education.* The 2-year medical school at the Mississippi State University could accept only 25 students each year; it had been compelled to reject 102 qualified applicants in the 4 preceding years. There was no college-level nursing education available for training nurses for teaching or other positions of leadership and responsibility.

*Hospitals.* Of the 114 hospitals in the State, only 5 were as large as 100 beds, and no general internships or residencies were available. Only 2,988 of the 4,200 beds in the general hospitals were of acceptable quality according to standards for safety, compared with a need of 7,594. The ratio of beds per thousand persons was 1.6, compared with a need of 4.5.

*Health Department Facilities.* There were only 12 adequate health department buildings, compared with a need for at least 70. (There are 82 counties, but several counties are in districts so that one main office serves several counties.)

*Hospitalization Insurance.* No statewide voluntary, nonprofit hospitalization insurance was available.

The State board of health, the State medical society, the Farm Bureau Federation, and others carried these facts to the people by personal visits and talks in almost every county. By newspaper and radio articles, by pamphlets and leaflets, the campaign went forward.

#### **Legislative Action**

These facts were also presented to the State legislature when it met in 1946, and a number of legislative committees went to work on plans to improve the situation. As a result, the legislature passed laws which (a) created the Mississippi State Medical Education Board, with sufficient funds for 2 years' operation, to grant and supervise medical scholarships; (b) created the Commission on Hospital Care to plan and direct the construction of hospitals and health centers; (c) provided for the construction of a 4-year medical school to be undertaken as soon as the rural hospital construction program

should reach a late stage of completion; (d) directed the Commission on Hospital Care to make a study of nursing needs and to plan a State program of nursing education; and (e) directed the Commission on Hospital Care to establish a statewide program of voluntary hospitalization insurance.

This was the broad outline of the integrated program to improve medical care in Mississippi. The medical education scholarship loan program, an important segment of the overall program, will be discussed in detail.

#### **Operation of the Program**

The State medical education board, which administers the scholarship loan program, is composed of five members: the dean of the University of Mississippi Medical School, the executive officer of the State board of health, the president of the State medical society, and two members appointed by the Governor for 4-year terms. It reviews applications, awards the scholarships, and approves the scholarship physician's location for practice.

A loan made through this program may not exceed \$1,250 a year for expenses, including tuition, payable direct to the medical school, or \$5,000 for 4 years. Veterans receiving aid under the GI bill of rights are eligible for loans of \$500 to \$1,000 per year payable direct to the students themselves.

To be eligible for a loan, an applicant may be either white or Negro, male or female, and must meet the following qualifications:

1. Be a resident of Mississippi.
2. Be in need of funds to complete his medical education.
3. Have completed his premedical work and be acceptable for enrollment in a class A medical school.
4. Agree to sign a contract with the State to return to Mississippi after graduation and 1-year internship (under exceptional conditions, 2-year internship may be permitted) to engage in the practice of medicine in a rural area approved by the board for a minimum of 2 years, regardless of the amount of the loan. If the scholarship physician elects to remain in the approved area for 5 years, the entire loan plus

interest is canceled at the rate of one-fifth for each year. Should he elect to repay the balance of his loan with interest at the end of 2 years, he may do so.

By the end of 1947, after the program had been in operation a year, 73 students, selected from 400 applicants, had been awarded scholarships. Applications had been received from persons in 79 of the 82 counties in Mississippi. The students were to attend 14 medical schools in the United States, including the 2-year medical school of the State university. Forty-two of these awards went to veterans of World War II; 7 went to women and 8 to Negroes.

The board's report to the legislature at the end of 1948 specified that 164 scholarships had been thus far awarded. This figure may be compared with the total of 48 awards which had been made by that time in the 8 other States having some kind of medical scholarship program in effect—Alabama, Georgia, Illinois, Indiana, Kentucky, North Carolina, South Carolina, Virginia. The Mississippi plan had produced 3 practicing physicians; the 8 other States had produced 1.

Accomplishments of the program by January 1, 1953, may be summarized as follows:

Scholarships awarded	406
Men, white	362
Men, Negro	30
Women, white	14
Medical graduates	195
Scholarship physicians now in practice in State	120
Scholarship physicians in the Armed Forces	15
Graduates serving internships	52
Physicians who served minimum of 2 years and repaid loan in cash	5
Physicians who died before fulfilling 5-year contract	3
Students who failed in medical studies and repaid loan in cash	2
Students still in school	209

The 120 scholarship physicians now in practice in the State are located in 77 towns in 52 of the 82 counties. This fact gives some idea of the wide distribution of these physicians.

#### Problems of the Program

Most of the problems which have arisen in connection with the scholarship program have been those of routine administration common

to the handling of substantial sums of money and the selecting of the most apt and promising candidates from hundreds of applicants.

There has been some misunderstanding on the part of the students as to the objectives of the program. Some students have felt that the board should allow completion of residencies which would qualify them for practice in such specialties as surgery, gynecology, obstetrics, or eye, ear, nose, and throat. One or two medical schools have also criticized the board's policy of restricting postgraduate training to general internship. The board feels, however, that the objective of the program is to increase the supply of general practitioners, which are so badly needed in the rural areas, and not the training of specialists. The board also feels that even if a physician intends to specialize at some time in his life, it is a sound and desirable procedure for him to spend as much as 5 years in general practice prior to specialization.

Two of the scholarship recipients failed in their medical studies, but they represent such a low percentage of those receiving scholarships (0.6 percent) that this is not considered a serious problem.

The death of three of the scholarship recipients before completion of their contract to practice presents a more serious problem. Perhaps more effective health examinations for applicants should be given consideration. One of the deaths, however, occurred in a young physician who 8 months after entering practice contracted poliomyelitis of the fulminating type; no way is known to have prevented this death.

#### Opportunities for the Student

The scholarship program offers the opportunity for qualified persons in Mississippi who are interested in becoming rural physicians but who are unable to finance a medical education to reach their goal without incurring debts which must be repaid in cash. It should be noted that the per capita income for Mississippi is only half as large as that for the Nation as a whole, \$700 as compared with \$1,400 in 1950. The program makes it possible for the student to make a plan for his medical education and for the first 5 years of practice with reasonable

assurance that he can carry out his plan, thus relieving him of many worries and giving him freedom to concentrate on his studies.

The student under this program also has the advantage of the guidance services of the medical education board, who can offer the student much information about the professional problems of preparing for medical practice and concerning desirable locations for practice in the State. Much of this information comes from the State medical society, the American Medical Association, the State board of health, and other agencies. The scholarship medical student is supplied with monthly reports on the general economic status of the State and of each of 14 specific subdivisions of the State. This information is furnished by the business research station of Mississippi State College, chambers of commerce, and local physicians and residents of various parts of the State.

Although a scholarship recipient is somewhat restricted as to postgraduate training and location for practice, he is free to attend any class A medical school in the United States, and his first choice of location for practice is approved if it is within the provisions of the law and in keeping with the objectives of the program. Furthermore, he is not prevented from specializing nor from practicing in any location he may choose after 2 years, if he wishes to repay the balance of the loan in cash, or after 5 years, debt free.

#### **Advantages to the State**

One of the chief advantages of this program to the State is the opportunity it provides for influencing physicians to render medical service where the service is most needed. The board accomplishes this objective primarily by its approval of the scholarship physician's location for practice, but, to some extent, also by its selection of applicants. There is some advantage, for example, in securing at least a portion of the medical students from small towns and rural areas, since it has been found that physicians reared in such areas are generally better adapted to practice there.

The program also gives the State an opportunity to influence medical students to become the type of physician most needed, and gives

it some measure of control over the supply of new physicians. Since the scholarship program has provided almost one-third of the increase in number of physicians in the State since its inception, an increase or decrease in the number of scholarships awarded should have a significant effect upon the number of new physicians.

Finally, the program supplements the 4-year medical-school program, giving the school an opportunity to serve Mississippi students who otherwise would be unable to finance a medical education.

#### **Six Years of Medical Progress**

The 6 years since the integrated program for improving medical care was begun have brought progress in all the fields of endeavor. The achievements may be summarized as follows:

*Physicians.* The supply of physicians in the State is on the increase for the first time since 1909. The number has risen from 1,112 in 1946 to 1,500 in 1953.

*Medical and Nursing Education.* A 4-year medical school, which will be a part of the State university, is under construction in Jackson. It will accommodate 400 medical students and 100 nursing students. As a part of this project, a teaching hospital of 350 beds is also under construction. A nursing school of college grade has already been established at the university and is completing its fourth year of successful operation. Although it is the only school of college grade for nurses in the State, it is ample to meet all needs for this class of nurses. Upon completion of the medical school in Jackson, the nursing school will be transferred there. Three schools for practical nurses, one of which is for Negroes, have been established and are furnishing well-trained practical nurses for the first time in the State's history.

*Hospitals.* Thirty-eight new hospitals have been constructed and equipped and are in operation; five more are under construction. Although several hospitals have been condemned and abandoned as unsafe, the number has increased from 114 in 1946 to 141 in 1953. A total of 2,258 hospital beds have been added and 895 more are under construction. Although 195 beds were lost in abandoned hospitals, the number has risen from 4,200 in 1946 to 6,273 in 1953.

*Hospitalization Insurance.* A statewide program of voluntary hospitalization and surgical insurance (Blue Cross and Blue Shield) was established in 1948 and is now the fastest growing State plan in the United States. It has a membership of 250,000.

Mississippi does not claim that this progress has been made by its efforts alone. Counsel and advice have been obtained from medical leaders all over the United States. Federal funds for hospital construction, provided under the Hospital Survey and Construction (Hill-Burton) Act, have been a welcome addition to State,

local, and private funds. All the costs of the medical education scholarship loan program, the various nursing education programs, the hospital and surgical insurance program, and the 4-year medical school project, and more than one-half of all hospital and health department construction costs, however, have been paid with State, local, and private funds.

Mississippi feels that it can indeed be proud of this outburst of medical progress, for it was long in the humble position of one who recognized its needs but whose utmost efforts were unavailing to meet them.

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## Public Health Service Staff Announcements

**Dr. Martin D. Young**, scientist-director of the Public Health Service Laboratory of Tropical Diseases, Columbia, S. C., was among the first 11 persons to win a Rockefeller public service award, it was announced in February. The award was granted for outstanding research work in tropical diseases. It will enable Dr. Young to conduct further research in this field through a 9-months' inspection tour of tropical disease centers in Europe and Asia. Dr. Young joined the Public Health Service and the laboratory staff in 1937, and became director of the laboratory in 1941.

**Dr. G. Milton Shy** has been appointed chief of clinical research of the National Institute of Neurological Diseases and Blindness of the Public Health Service. Dr. Shy will be responsible for the planning and guidance of clinical research into the neurological and sensory disorders, among them multiple sclerosis, cerebral palsy, epilepsy, cataracts, and glaucoma. For these clinical studies, the Institute has been allocated 42 beds and 19 laboratories in the new Clinical Center at Bethesda, Md.

Prior to his appointment, Dr. Shy was chief of the neurological service at the Colorado Medical School and was a consulting neurologist at several Colorado hospitals.

Dr. Shy received his M.D. from the University of Oregon Medical School in Portland and received his special neurological training at Queen Square, London, and at

the Montreal Neurological Institute, Quebec.

**Dr. James K. Shafer and Dr. Clarence A. Smith** were appointed chief and assistant chief, respectively, of the Division of Venereal Disease, Public Health Service, in March 1953, by Surgeon General Leonard A. Scheele.

Dr. Shafer succeeds Dr. Theodore J. Bauer who now heads the Communicable Disease Center of the Public Health Service at Atlanta. As the new assistant chief, Dr. Smith assumes the post to which Dr. Shafer was appointed in 1950.

A veteran of 14 years' service in the commissioned officers corps of the Public Health Service, Dr. Shafer has served as venereal disease control officer in the health departments of Chicago and Moline, Ill., and Wayne County, Mich. He also served as Public Health Service consultant in the Chicago regional office.

Preceding his new appointment, Dr. Smith was venereal disease control officer for Chicago. A Public Health Service commissioned officer since 1937, he has served as medical officer in charge of the South-eastern Medical Center, Savannah, and of the Michigan Rapid Treatment Center, Ann Arbor, and has seen duty in Alabama's and South Carolina's venereal disease control programs. Dr. Smith was assistant professor of tropical medicine and public health at Tulane University School of Medicine from 1948 to 1950.

# Time Between Tuberculosis Reporting And Death

By EDWARD X. MIKOL, M.D., M.P.H., and BEN Z. LOCKE, M.S.

THE REPORTING of tuberculosis cases to health departments is one of the most important administrative procedures in tuberculosis control. Such reporting identifies the person who is in need of medical and public health supervision. It results in getting him registered for such supervision and keeps him so until death, cure, transfer, or other reason for discontinuation of supervision. Each newly reported case is a new source for contact investigations leading to the possible discovery of other new cases, and reporting provides valuable statistics for the study of tuberculosis morbidity.

It has long been known that a substantial proportion of persons who die from tuberculosis have never been reported as cases before death. Each such death represents a person who either was not found as a case during life or at least failed to be reported officially as a case. Since reporting is the event which, generally speaking, puts the public health machinery into action for a given case and possible associated cases, such nonreporting signifies lack of opportunity for care and supervision by official agencies and for fulfillment of all the other purposes of reporting.

This is a report of a partial study over a period of years of tuberculosis deaths unreported as cases in New York State, exclusive of

New York City. The "unreported deaths" consist of cases reported on the same day as the date of death, cases reported after death, and deaths never reported as cases. The study was partial in that only certain information from death certificates was analyzed. A complete study would necessarily include a detailed field investigation of many factors pertaining to each unreported death, with perhaps a similar investigation, as a control, of deaths previously reported as cases.

The purpose of the study was to analyze some of the characteristics of the unreported deaths and particularly to determine, if possible, whether there might be some extenuating factors to account for the nonreporting as had been suggested by some earlier observations.

## Frequency of Unreported Deaths

Table 1 shows the distribution of tuberculosis deaths according to the time of reporting as cases for two 5-year periods (annual average for 1940-44 and for 1945-49) and for 1951. The fourth column shows that slightly over 20 percent of the total deaths were never previously reported as cases before death; for example, during the period 1945-49, out of an annual average of 1,761 total tuberculosis deaths, 398 or 22.6 percent were unreported deaths.

Information is not readily available as to how this figure of a little over 20 percent for upstate New York compares with other States. (This figure should not be confused, of course, with the percentage of the total reported cases in a given year which are first "reported" by

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*Dr. Mikol is general director of tuberculosis hospitals in the division of tuberculosis control, New York State Department of Health, Albany, and Mr. Locke is the senior biostatistician of the division.*

death certificate. In upstate New York the latter figure was 9 percent in 1940 and 5 percent in 1951.)

Table 1 shows also the number and percentage of deaths which were reported before death, divided into four "time" groups. It is encouraging that the percentage reported less than 3 months before death decreased during the period from 16.7 in 1940-44 to 10.1 (sixth column) in 1951; at the same time, the percentage reported 12 months or more before death increased from 46.0 to a peak of 56.2.

In considering the significance of the unreported deaths, the third column of table 1 shows that the number has decreased substantially from an average of 451 deaths during 1940-44 to a low of 235 in 1951. However, the percentage of unreported deaths in relation to the total deaths has shown little change since at least 1940; the annual fluctuation has been only from a high of 23.7 to a low of 20.6. This slight variance occurred during a period when there was a great expansion and improvement in case-finding techniques. It is one of the observations which has raised the question as to whether at least some of the nonreporting during life may be due to some "uncontrollable" factors.

#### Characteristics of Unreported Deaths

Certain characteristics of the unreported deaths for the three representative periods were analyzed.

##### Sex and Age

There is apparently no difference in the proportion of unreported deaths in the two sexes.

In each sex group there is a higher proportion of the unreported deaths in the age group 65 or over than would be expected by chance alone.

##### Place of Death

There is no difference in the proportion of unreported deaths in cities with populations of 50,000 or more as compared with the rest of the area. Table 2 shows the distribution of unreported and reported deaths in 1951 in relation to the place of death within urban and rural areas. The striking fact is that out of 194 tuberculosis deaths in general hospitals, 111, or 57 percent, were not reported before death, as compared to the 21 percent total unreported, to the 9 percent in tuberculosis hospitals (includes general hospitals with separate tuberculosis buildings or services), the 21 percent in other institutions, and the 22 percent in private dwellings. Stated another way, general hospitals contributed only 17 percent of all the deaths (194 out of 1,134), whereas they account for 47 percent of the total unreported deaths (111 out of 235).

This could mean that general hospitals are lax in reporting tuberculosis cases; perhaps this is due in some instances to failure to assign specific responsibility for official case reports. Also, it may be assumed that for the most part, patients admitted to general hospitals are more likely to have the acute types of disease, including pulmonary tuberculosis, with a diagnosis of tuberculosis being made only a short time before death.

Regardless of the explanation, this finding provides eloquent additional evidence for the

**Table 1. Tuberculosis deaths in relation to time of reporting as cases, New York State, exclusive of New York City, 1940-44, 1945-49, and 1951**

Year	Total deaths		Not reported before death		Reported before death							
					Less than 3 months		3 to 6 months		6 to 12 months		12 months or more	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1940-44 <sup>1</sup> ---	2,024	100.0	451	22.3	338	16.7	132	6.5	172	8.5	931	46.0
1945-49 <sup>1</sup> ---	1,761	100.0	398	22.6	264	15.0	104	5.9	140	8.0	855	48.6
1951-----	1,134	100.0	235	20.7	114	10.1	63	5.6	84	7.4	638	56.2

<sup>1</sup> Annual average.

**Table 2. Tuberculosis deaths according to place of death and time of reporting as cases, New York State, exclusive of New York City, 1951**

Place of death	Total deaths		Not reported before death		Reported before death	
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent
Total.....	1,134	100	235	21	899	79
Tuberculosis hospitals.....	654	100	62	9	592	91
General hospitals.....	194	100	111	57	83	43
Other institutions.....	105	100	22	21	83	79
Private dwellings.....	181	100	40	22	141	78

need of extending to all general hospitals the program of routine chest X-ray examinations of all patients admitted. Also, cases of tuberculosis should be promptly reported in order that the necessary examinations of the family-household contacts may be made.

With reference to deaths in private dwellings, the percentage of unreported deaths, 22 percent, was about the same as the total of 21 percent for all places; moreover, it is significant that only 40, or 17 percent, of the total 235 unreported deaths occurred in private dwellings.

#### *Site of Disease*

Of the total 1,134 tuberculosis deaths in 1951, 44, or 4 percent, were due to tuberculosis of the meninges or to acute disseminated tuberculosis; 25 of these were unreported before death and 19 were reported. The 25 unreported deaths represent 11 percent of the total 235 unreported deaths, whereas the 19 reported are but 2 percent of the total 899 which were reported. This then is another group of deaths the nonreporting of which may be accounted for by the acuteness of disease and the usually early fatality. All 44 deaths, incidentally, occurred in either tuberculosis or general hospitals.

#### *Performance of Autopsy*

Of the total 1,134 deaths, 317 autopsies were performed; 96 of these were among the unreported and 221 among the reported deaths. The 96 unreported deaths with autopsy repre-

sent 41 percent of all 235 unreported deaths, whereas the 221 reported are only 25 percent of the total 899 reported. Unfortunately, it is impossible, without a field investigation, to determine in which instances diagnosis was not made until the autopsy was performed. But it may safely be assumed that this was so in many of these 96 unreported deaths, and this might thus be another reason for nonreporting. One can only surmise as to the number in this group in whom a diagnosis could have been made during life by means of proper and adequate diagnostic procedures.

#### *Other Possible Factors*

Deaths from tuberculosis occurring in New York State are allocated to the place of residence of the decedent, regardless of the length of such residence. Some of the unreported deaths may thus be of persons who have moved into the upstate New York area only a short time before death. Factual data on this point, however, could be secured only through a field study.

Finally, errors in the certification of the cause of death may account for some of the unreported cases.

#### **Discussion**

If it is accepted that reporting of tuberculosis cases is an essential administrative procedure in tuberculosis control, then the proportion of tuberculosis deaths not reported during life as cases becomes an important measure of some of the control activities. The observations reported here suggest that some of the nonreporting may be due to certain extenuating—or even uncontrollable—factors.

But, to the extent that such factors do play a part, at best they can account for only a portion of the unreported deaths. Nonreporting is often due to a lack of awareness of the need and purpose of reporting or a lack of a feeling of responsibility.

To be sure, the patient who is in a hospital or some other institution is at least segregated from his household associates. But one of the purposes of reporting is to assure that such associates are examined promptly. Besides, at the time of diagnosis, a fatal outcome cannot

be foretold, and reporting is thus essential for the sake of the posthospital care and supervision of the person diagnosed.

Thus, although there may be certain pathogenetic or other factors which tend to result in delayed reporting of tuberculosis cases, efforts must be intensified to improve the status of this essential activity in tuberculosis control. The health officer or other administrator responsible for tuberculosis control in a community can use each unreported death as a lead in such efforts.

#### **Summary**

Approximately 20 percent of persons dying from tuberculosis in New York State, exclusive of New York City, have not been reported as cases during life. Because of the vital place of reporting in tuberculosis control, this is a significant index in relation to the planning, conduct, and evaluation of the program.

However, certain observations suggest that nonreporting of cases before death may be due

in part to factors which are uncontrollable or, at least, difficult to control: (a) Although the number of unreported deaths has decreased substantially since 1940, the proportion of these to the total tuberculosis deaths has shown little change; (b) the proportion of unreported deaths is very high (57 percent) in general hospitals, where, on the whole, patients with acute types of tuberculosis are more likely to be admitted; (c) some of the unreported deaths are due to acute tuberculous meningitis and acute disseminated tuberculosis; (d) in some instances the diagnosis of tuberculosis is not made until autopsy; (e) some of the unreported deaths may be of persons who have only recently moved to the area; (f) erroneous certification of the cause of death may account for some unreported deaths.

But much of the delayed reporting is controllable, and efforts must be continued and intensified to secure the reporting of all tuberculosis cases promptly at the time of first diagnosis.

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## **Reported Tuberculosis Morbidity and Mortality, 1952**

Provisional reports from State health departments indicate that there were approximately 111,300 cases of tuberculosis newly reported in the United States during the calendar year 1952. Of these, about 85,000 were active and probably active cases (group "A" cases), giving an annual rate of 55 per 100,000 population.

Total new cases reported during 1952 represented a decline of about 6 percent from the number reported in 1951. A large portion of this decline is no doubt due to the new practices in reporting cases of tuberculosis and in counting them—*Public Health Reports*, 66:1291-1294 (1951).

The National Office of Vital Statistics' 10-percent sample of death certificates indicates that there were approximately 25,000 tuberculosis deaths, all forms, in 1952. This is a decline of approximately 16 percent from a similar provisional figure for 1951. Thus, the trends of the past several years are continued in 1952: a substantial decline in tuberculosis mortality but a comparatively small decline in the number of newly reported cases.

# Village Polyclinics in Middle Java

By WARREN A. KETTERER, M.D., M.P.H.

THE PUBLIC HEALTH DIVISION of the Mutual Security Agency mission to Indonesia was requested in January 1952 to assign a medical officer for a 2-week period to two rural polyclinics in the Pati Peninsula on the Island of Java. The core of the peninsula is Mount Moerio, some 40 miles northeast of Semarang, and around the mountain is a fertile plain some 15 miles wide. During the war, dikes were destroyed and mosquito breeding increased greatly, causing a serious rise in the malaria incidence. This area between the mountain and the sea is densely populated.

The clinics are on opposite sides of the mountain, one in Margaredjo on the northeast side and the other in Kajuapu on the southwest side. Operated by the Mennonite Mission in Indonesia, which has had a medical relief unit in the area since 1902, the two polyclinics are located in Mennonite-owned schoolhouses. The staff, which lives at Pati, consists of a French physician, a German nurse, four Americans, including the administrator and the laboratory technician, and Javanese helpers. The latter act as interpreters, maintain records, dispense medicines, and dress wounds. No laboratory facilities are available at the Margaredjo clinic; the Kajuapu clinic has equipment for minimal laboratory procedures. The Margaredjo clinic operates 2 days a week, with

an average daily attendance of 150 patients; the Kajuapu clinic, 3 days a week, with an average daily attendance of 90 patients.

The writer's assignment to these clinics, from January 4 through 19, 1952, provided an opportunity to study the disease entities of an Indonesian rural population and to observe the problems involved in providing preventive and therapeutic services.

## Analysis of Cases

A total of 1,029 patients, including 883 new patients, were seen during the 11-day visit. Sixty-one percent of the new patients were male, 39 percent female; 16.8 percent were under 9 years of age, 56.4 percent between 10 and 40 years, and 26.8 percent more than 40 years of age.

Only superficial examinations of the patients were possible because of the large number of patients and because of the language difficulty. A brief case history and a statement of the present complaint was obtained from each patient through an interpreter, translating through three languages. Consequently, minor diseases and complaints may have been overlooked if not indicated in the history. Even some major diseases may have been overlooked since many patients had more than one major disease. For example, one patient who had tuberculosis, scabies, malaria, trachoma, and tinea complained only of sudden severe diarrhea. Although laboratory facilities were minimal, laboratory confirmation was obtainable for tuberculosis, malaria, and gonorrhea.

An inventory of the major complaints of the 883 new patients (table 1) and of the major diagnoses for these patients (table 2) indicates

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*Dr. Ketterer, a commissioned officer of the Public Health Service, is deputy chief of the public health division of the Technical Cooperation Administration Mission (formerly the Special Technical and Economic Mission, Mutual Security Agency) to Indonesia. He has been with the mission since June 1951.*

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that malaria, yaws, and tropical ulcers and their accompanying symptoms are responsible for 54 percent of the illness in this population group.

Primary or secondary nutritional deficiencies were present in almost 100 percent of the patients. The complaints of aching bones and joints were attributed to secondary nutritional deficiencies resulting from diseases such as malaria and tuberculosis. The cases presented in table 2 represent those in which beriberi or other avitaminosis was the major diagnosis.

Since malaria is endemic in the area, all cases of fever and chills were diagnosed as malaria unless another diagnosis was proved. Diagnoses of malaria were frequently confirmed by microscopic examination of both thick and thin

smears. Because of the apparent high incidence of malaria in Margaredjo, 39 school children were examined for palpable spleens; of these 29, or 74 percent, had splenomegaly. Spleen index confirmation for malaria is usually reliable in Indonesia, since leishmaniasis and schistosomiasis are not prevalent.

Ulcers were the presenting complaint of the greatest number of patients. The differential diagnosis of tropical ulcer as distinguished from gummas of yaws and syphilis was difficult. Multiplicity of lesions, presence of "patek" (framboesia), history of trauma, and presence or absence of other signs and symptoms were used for diagnosis. Many patients with tropical ulcers gave histories of abrasions from bamboo, knife wounds, chengkol (hoe)

Table 1. Major complaints of 883 new patients

Complaint	Kajuapu		Margaredjo		Total	
	Number	Percent	Number	Percent	Number	Percent
<i>Dermatologic</i>						
Ulcer	85	13.2	156	25.6	241	19.3
"Bubul" (crab yaws)	33	5.1	12	2.0	45	3.6
"Patek" (framboesia)	21	3.3	10	1.6	31	2.5
Pyoderma	14	2.2	25	4.1	39	3.1
Itching patches	18	2.8	16	2.6	34	2.7
Skin eruption	16	2.5	19	3.1	35	2.8
<i>Systemic</i>						
Aching bones and joints	65	10.1	64	10.5	129	10.3
Fever	50	7.9	63	10.3	113	9.0
Chills	32	5.0	35	5.7	67	5.4
Cough	47	7.3	53	8.7	100	8.0
Headache	14	2.2	7	1.1	21	1.7
<i>Ear, eye, nose, and throat; respiratory</i>						
Eye inflammation	30	4.7	16	2.6	46	3.7
Blindness, deafness	10	1.6	4	.7	14	1.1
Dyspnea	13	2.0	10	1.6	23	1.8
Earache and/or discharge	11	1.7	8	1.3	19	1.5
<i>Genitourinary</i>						
Genital lesion	14	2.2	2	.3	16	1.3
Dysuria	13	2.0	2	.3	15	1.2
Genital discharge	12	1.9	3	.5	15	1.2
"Woman's disease"	8	1.2	1	.2	9	.7
<i>Other</i>						
Diarrhea	9	1.4	12	2.0	21	1.7
Abscess	9	1.4	10	1.6	19	1.5
Bone deformities	11	1.7	0	0	11	.9
Painful feet	14	2.2	6	1.0	20	1.6
Miscellaneous	93	14.5	75	12.3	168	13.4
Total	642	-----	609	-----	1,251	-----

lacerations of feet and toes, burns, shrapnel wounds, and bites from leeches and boars.

The penicillin provided by the Indonesian Ministry of Health was used sparingly and in minimal recommended doses. However, the response to penicillin therapy was unusually dramatic. Huge facial swellings from long-standing purulent otitis media and mastoiditis disappeared overnight. Three days after receiving 300,000 units of penicillin aluminum monostearate followed by warm soaks, a patient with a vast granulating infection of the entire hand and forearm returned with all but a few isolated areas healed. Several persons with double and triple infections of differing etiology responsive to penicillin were successfully treated with one injection of 300,000 units of the drug.

Yaws was prevalent, especially in the Margaredjo area, and was diagnosed on the basis of signs and symptoms in 205 of the 883 patients, although blood tests were not available. Sev-

eral cases of severe late yaws were observed in addition to the all-too-prevalent crab yaws and larger destructive gummas.

The most common eye disease found among these patients was trachoma, which was seen in all stages.

Acute venereal diseases were more prevalent in Kajuapu than in Margaredjo, a venereal disease being the major diagnosis for 11 percent and 2 percent of the patients, respectively. The proximity of Kajuapu to a military camp may explain this difference. The converse was observed in the geographic incidence of tropical ulcer and *falciparum* malaria.

Scabies, avitaminosis, and tuberculosis, diseases common to both clinics, were comparable in incidence. Cases of tuberculosis, however, were undoubtedly undertabulated because only those patients presenting obvious symptoms or whose sputum was positive on direct examination were included. Since no laboratory was available at Margaredjo, Kajuapu showed a

Table 2. Major diagnoses for 883 new patients

Diagnosis	Kajuapu		Margaredjo		Total	
	Number cases	Percent of 428 patients	Number cases	Percent of 455 patients	Number cases	Percent of 883 patients
Malaria	47	11.0	94	20.7	141	16.0
Tropical ulcer	(20)	(4.7)	(110)	(24.2)	(130)	(14.7)
Nontraumatic	5	1.2	64	14.1	69	7.8
Traumatic	15	3.5	46	10.1	61	6.9
Yaws, all types	137	32.0	68	14.9	205	23.2
Tuberculosis	41	9.6	30	6.6	71	8.0
Trachoma	25	5.8	12	2.6	37	4.2
Avitaminosis <sup>1</sup>	31	7.2	36	7.9	67	7.6
Scabies	34	7.9	35	7.7	69	7.8
Dysentery	8	1.9	12	2.6	20	2.3
Syphilis, all types	11	2.6	5	1.1	16	1.8
Gonorrhea	28	6.5	4	.9	32	3.6
Lymphogranuloma venereum	5	1.2	0	0	5	.6
Chaneroid	4	.9	0	0	4	.5
Granuloma inguinale	1	.2	0	0	1	.1
Tinea	11	2.6	17	3.7	28	3.2
Impetigo	5	1.2	14	3.1	19	2.2
Otitis media, mastoiditis	9	2.1	8	1.8	17	1.9
Pneumonia	5	1.2	4	.9	9	1.0
Heart disease	6	1.4	7	1.5	13	1.5
Leprosy	1	.2	0	0	1	.1
Other	101	-----	60	-----	161	-----
Total	530	-----	516	-----	1,046	-----

<sup>1</sup> As a single diagnosis.

much larger number of positive tuberculosis cases.

These statistics indicate the importance of regional surveys prior to undertaking preventive measures to control these diseases, particularly in a country where personnel and supplies are scarce.

### Needs and Objectives

The poverty and disease existing among the population of this rich agricultural area of the Pati peninsula appear representative of much of rural Java. Despite the seeming agricultural prosperity of the peninsula, nutritional deficiencies are almost universal. Superimposed upon poverty and malnutrition are diseases induced by poor housing, lack of sanitation, overcrowding, and lack of education. Families are unable to work because of debility and sickness; thus they are caught in the vicious cycle of illness and poverty.

The need and desire for and appreciation of medical care were demonstrated by the distances the patients traveled, usually on foot, to reach the clinics; 48 percent of the 883 new patients came 4 or more miles over muddy and rough terrain. Occasionally patients travel for 8 or 10 hours by horse cart, arriving the night before they attend the clinic. Sometimes regular trips are arranged for groups who share expenses. Although no specific records of the percentage of patients making return visits to the clinic were kept, approximately half of the patients who had been requested to return did so.

For the most part, the nearly 1,000 practicing physicians in Indonesia are engaged in curative rather than preventive health activities. They object to the competition of foreign-staffed dispensaries. Therefore, increased preventive programs in public health appear to be the most practicable for reducing the suffering of the masses of the rural population.

About 90 percent of the Indonesian Ministry of Health budget of 500 million rupiah (less than \$1 per capita per year) is devoted to curative medical care and administration. Hence, technical assistance will be needed for the preventive programs. Outside assistance in the form of commodities and personnel would significantly improve, perhaps double or triple,



**At the request of the Government of Indonesia, the United States, through its Technical Cooperation Administration Mission to Indonesia, is assisting the country in numerous health activities: disease control, professional education, and the rehabilitation of health centers, hospitals, clinics, and research and teaching institutions. Shown here are a maternal and child health clinic in Djakarta, Java (above) and preparations for giving injections in the treatment of yaws (below).**



present preventive efforts against some of the major diseases.

The diseases which can be prevented most effectively deserve first attention. In a country having perhaps 30 million cases of malaria and 12 million cases of yaws, supplies, equipment, and technicians could bolster existing malaria and yaws campaigns by increasing area coverage and assisting in training local subprofessional personnel to carry on activities.

Tuberculosis presents one of the most difficult and threatening public health problems. Currently, there appears to be an overemphasis on leprosy—a far less menacing disease than tuberculosis—and an underemphasis on tuberculosis. A reversal of attention to these diseases would seem desirable. Practical isolation facilities and BCG inoculation might be feasible, but mass fluoroscopy and X-ray are not indicated until minimal isolation can be provided for the great numbers of persons with active tuberculosis who are now spreading the disease.

Basically, additional education facilities for the Indonesian rural population, which should provide health education as well as other types,

are essential. For those unable to obtain formal schooling, health education devices such as the nutritional posters currently used by the Ministry of Health, showing nutritious yet inexpensive foods should be expanded. Medical, nursing, and public health training for Indonesians should be accelerated through the loan of foreign professors to Indonesian institutions and through the advance training of Indonesians elsewhere.

The prevention of diseases that increase poverty and reduce the ability of labor to produce food in the fertile and densely populated Pati peninsula appears to be a necessary objective of the Indonesian Government, both from the standpoint of economic gain and from the standpoint of strengthening the Government's relations with the people. The World Health Organization, the United Nations International Children's Emergency Fund, and other international organizations as well as the Technical Cooperation Administration are rendering effective assistance to the Indonesian Government in the implementation of its program.

### **Veterans' Syphilis Records**

Syphilis registers for veterans of the United States Army and of the United States Air Force were transferred from the dermatology and syphilology section of the Veterans Administration to the Department of the Army on April 13, 1953. The Department of Medicine and Surgery of the Veterans Administration has announced the closing of the activities of the syphilis follow-up study unit. Public health agencies need no longer return VA Forms 10-2550 to the Veterans Administration.

Health departments, clinics, physicians, and others wishing information concerning these records should direct inquiries to: **Military Personnel Records Center, The Adjutant General's Office, Department of the Army, 4300 Goodfellow Boulevard, Building 203, St. Louis 20, Mo.**

Inquiries concerning syphilis records for Navy and Marine Corps veterans should be directed to: **Department of the Navy, Bureau of Medicine and Surgery, Physical Qualifications and Medical Records Division, Code 33, Washington 25, D. C.**

Inquiries about the syphilis records of former members of the United States Coast Guard should be sent to: **The Commandant, United States Coast Guard, Attention Chief Medical Officer, Washington 25, D. C.**

# Serology of Brucellosis in Rural Indiana

By S. R. DAMON, Ph.D., C. R. DONHAM, D.V.M., L. M. HUTCHINGS, D.V.M., Ph.D.,  
B. T. SIMMS, D.V.M., and JAMES H. STEELE, D.V.M.

REGIONAL LIVESTOCK investigations in conjunction with human epidemiological studies have shown swine and cattle to be major reservoirs of brucellosis in this country. Swine have been primarily implicated in some areas and cattle in others. However, the actual prevalence of infection in the rural human population, a group with a high potential of exposure, and the extent to which it parallels the prevalence in farm animals remains more or less a matter of conjecture.

To obtain a more comprehensive concept of the human-livestock relationships, representatives of several agencies concerned with the problem of brucellosis, meeting in Indianapolis in 1946, suggested a field study of certain Indiana localities. They proposed to investigate areas representative of dairy cattle, swine breeding, and mixed types of animal husbandry by testing farm families and livestock for serologic evidence of infection. It was hoped that the extent of relative infection might then be inferred from the distribution of titers.

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*Dr. Damon is director of the bureau of laboratories, Indiana State Board of Health; Dr. Donham and Dr. Hutchings, professor of veterinary science and head of the department of veterinary science, Purdue University, respectively; Dr. Simms, chief of the Bureau of Animal Industry, U. S. Department of Agriculture; and Dr. Steele, veterinary director, Communicable Disease Center, Public Health Service.*

*The project was jointly sponsored by the Bureau of Animal Industry; the department of veterinary science, Purdue University; the Indiana State Board of Health; and the Public Health Service.*

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Accordingly, the township was selected as a suitable survey unit. The ideal township was considered one where the desired type of animal husbandry was practiced, a high percentage of resident families owned their farms, good lateral roads and a centrally located school or community building existed, no centers of urban population were implicated, and finally, the people were believed to be receptive to such a project. These criteria and recommendations by agencies familiar with the regional agriculture of the State guided the selection of survey areas.

During the winter months of 1946 through 1950 nine townships were surveyed. Blood samples were collected from a major portion of the farm population and livestock and were tested for *Brucella* agglutinins. The average area of the townships was 34 square miles. Surveys were conducted in the winter to avoid conflict with farm activities. Upon completion of all studies, 2,622 persons and 13,373 animals on 930 farms had been tested.

When all data were compiled, there appeared to be little correlation between the human and animal serology. The comparatively small number of human reactors were distributed far more uniformly among the nine townships than were the livestock reactors. These coexisting serologic patterns are presented and discussed in this report.

## Plan of the Surveys

Organizing local citizens for the surveys proved an interesting experience in public health tactics. With the county agricultural agent as the pivot, the proposed study was first offered to members of the county medical so-

ciety, then to community leaders who could serve in an organizational capacity. Intensive publicity preceded the actual testing, which was usually completed within 1 month following formal selection of a township for survey. For the most part, local physicians collected the human blood samples, and veterinarians from the Bureau of Animal Industry, U. S. Department of Agriculture, collected the animal blood specimens (1).

Upon completion of each survey, a résumé of the serologic results was reported to the county agent's office for publication in the local newspaper. Positive results of individual human tests were forwarded to physicians designated by the participants at the time their blood specimens were drawn. Results of the animal tests were reported directly to the respective owners. When animal reactors were found on the premises, a State veterinarian or one from the Bureau of Animal Industry returned to discuss possible control methods with the owners.

It should be noted that the incorporation of educational benefits for those persons supplying the raw data and the coordination of both technical and lay facilities of many agencies were integral factors in the program's success.

#### Serologic Methods

*Human serums.* Agglutination tests were performed at the Indiana State Board of Health Laboratories. Serums were examined by employing the rapid plate method (Huddleson) as described by Hitchens (2), and a standardized *Brucella abortus* antigen. In performing the tests, serums and antigen were mixed in proportions to give results comparable to those obtained from the examination of serum dilutions of 1:40 and 1:80 by the test tube method. Strongly reacting serums were further diluted to determine titers.

*Livestock serums.* Specimens collected from animals were examined at the brucellosis testing service laboratory of Purdue University except for those obtained in the Elmore and Steele township surveys, which were tested in a Bureau of Animal Industry mobile laboratory unit.

Serums were examined by using the official

Bureau of Animal Industry plate agglutination technique and *Br. abortus* antigen. In this test, serum and antigen are mixed in proportions to give results comparable to those of the test tube method with serum dilutions of 1:50, 1:100, and 1:200. Examination of swine serums included the 1:25 dilution.

#### Results

Only individuals 10 years of age or older were examined for *Brucella* agglutinins. Of 2,622 persons, 310 (11.8 percent) came from nearby towns and the remaining 2,312 from rural areas. The former were for the most part included in the Elmore, Steele, and Winfield township surveys. The extent of serologic activity encountered in the total population tested, urban and rural, is summarized in table 1. It was rather surprising to find that only 60 persons (2.3 percent) showed any evidence of agglutinins, and of these only 3 individuals (0.1 percent) 10 years of age or older had a positive titer (4+ reading) of 1:80 or higher. Of the group of 60 persons with agglutinins, only 2 were urban residents and 2 were rural children 10-13 years of age. The remainder were all rural adults.

Of the 2,312 rural persons examined, 16.5 percent were 10-13 years of age, 43.7 percent were males 14 years or older, and 39.8 percent were females 14 years or older. With the exception of Prairie Township, it is estimated that 40-90 percent of the rural population in these age groups were tested in the individual areas. The response in Prairie Township was somewhat less satisfactory. Since the study was designed

Table 1. Extent of serologic activity found in total population<sup>1</sup> tested

Agglutination reading	Number reacting	Percent-age of population tested	Percent-age of reacting group
1+ at 1:40-----	24	0.9	40.0
>2+ at 1:40-----	33	1.3	55.0
<4+ at 1:80-----	3	.1	5.0
>4+ at 1:80-----			
Total reacting-----	60	2.3	100.0

<sup>1</sup> 2,622 persons, 10 years of age and older.

## Indiana townships

where *Brucellosis* surveys were conducted

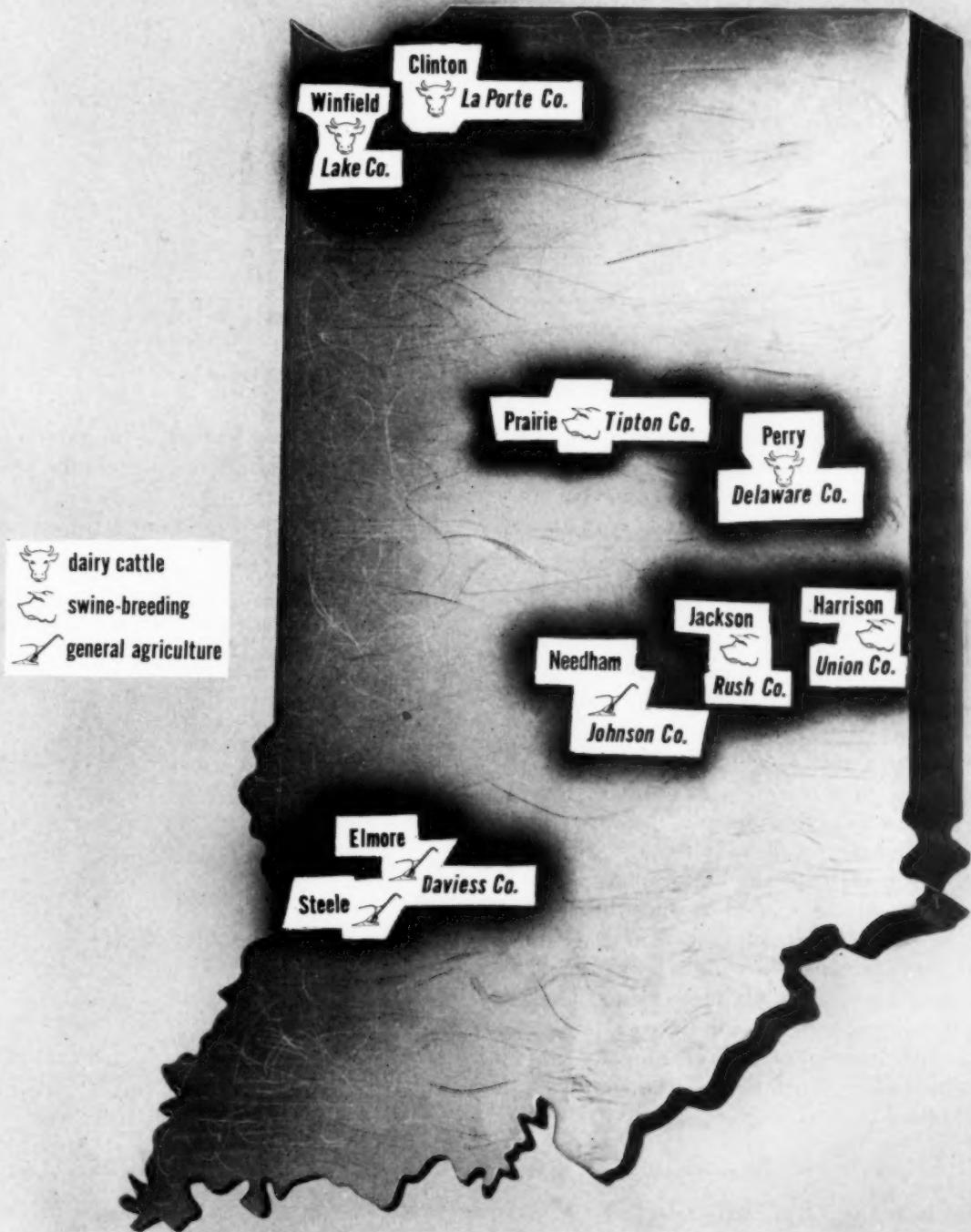


Table 2. Number and percentage of rural persons 14 years and older found with brucellosis titers<sup>1</sup> in the townships

Township	Both sexes			Males			Females		
	Tested	Number	Percent	Tested	Number	Percent	Tested	Number	Percent
<i>Dairy cattle</i>									
Perry-----	361	5	1.4	182	3	1.6	179	2	1.1
Clinton-----	178	3	1.7	96	3	3.1	82	0	0
Winfield-----	223	5	2.2	118	3	2.5	105	2	1.9
<i>Swine breeding</i>									
Harrison-----	169	2	1.2	93	1	1.1	76	1	1.3
Prairie-----	138	2	1.4	66	1	1.5	72	1	1.4
Jackson-----	158	1	.6	82	1	1.2	76	0	0
<i>Mixed husbandry</i>									
Elmore-----	251	5	2.0	138	4	2.9	113	1	.9
Steele-----	196	4	2.0	107	3	2.8	89	1	1.1
Needham-----	256	7	2.7	128	4	3.1	128	3	2.3
Total-----	1,930	34	<sup>2</sup> 1.8	1,010	23	<sup>2</sup> 2.3	920	11	<sup>2</sup> 1.2

<sup>1</sup> At least a 2+ reading with serums diluted 1:40.

<sup>2</sup> Standard errors are 0.3 percent for both sexes, 0.5 percent for males, and 0.4 percent for females.

primarily to survey the mature farm population, attention is focused upon the prevalence of reactors among the 1,930 persons 14 years and older who were living in the rural areas. The number of reacting individuals in this group is given for each township in table 2. Based on all nine township samplings, 1.8 percent of the persons tested displayed some positive titer. Among the males, 2.3 percent reacted. Of the females, 1.2 percent reacted. This difference of 1.1 percent was found to be of only slight statistical significance.

A tabulation of information obtained concurrently with the blood testing indicated more than 80 percent of the adult males, approximately 70 percent of the children 10-13 years of age, but only 54 percent of the adult females with histories of direct animal contact. All those rural persons showing a serologic titer, with four exceptions, claimed animal contact. The four exceptions, however, did drink raw milk. Information on the consumption of raw milk by persons included in the surveys was incomplete.

#### Prevalence in Cattle

The majority of animals tested were cattle, 7,918 altogether. At least 60-80 percent of the

adult cattle were surveyed in each township except Prairie where the percentage was somewhat less. At the time of drawing the blood samples, field crews obtained information re-

Table 3. Composition of cattle population tested and distribution of serologic reactors<sup>1</sup>

Group	Num- ber tested	Per- cent- age of total popu- lation	Reactors	
			Num- ber	Per- cent- age of group
All cattle-----	7,918	100.0	543	6.9
Vaccinated-----	788	10.0	179	22.7
Unvaccinated-----	6,999	88.4	347	5.0
Unknown-----	131	1.6	17	13.0
Unvaccinated cattle:				
Males-----	404	5.1	6	1.5
Under 1 year---	65	.8	0	0
1 year or more--	339	4.3	6	1.8
Females-----	6,595	83.3	341	5.2
Under 1 year---	348	4.4	7	2.0
1-1.9 years----	823	10.4	9	1.1
2 years or more--	5,424	68.5	325	6.0

<sup>1</sup> At least a 4+ agglutination reading in 1:100 dilution.

garding age, sex, and prior use of *Brucella* vaccine. These data are summarized in table 3 along with the total number (543) and percentage (6.9) of reactors found.

A bovine reactor in this study is defined as one whose serum at a dilution level of 1:100 or higher completely agglutinated the standard antigen. Those animals giving a partial reaction at this level or a complete reaction only in the 1:50 dilution are designated as suspects. Data are tabulated separately for all cattle and for only unvaccinated cattle. These two analyses are included to facilitate interpretation of results and their subsequent comparison with findings reported from other areas.

In table 4 an area breakdown is given for the number and percentage of cattle reactors encountered among the total number tested, among the unvaccinated animals only, and among the unvaccinated mature females. The latter group contributed 93.7 percent of all unvaccinated cattle reactors. In addition to the positive reactors, 645 (8.1 percent) of the total cattle tested were found to be suspects. When the results from testing vaccinated ani-

mals were excluded from the data, this number was reduced to 440 (5.6 percent).

Final tabulations showed that 10 percent of the tested animals, or one-third (32.8 percent) of all reactors, had been previously vaccinated either as calves or as adults. Of the vaccinated cattle, 22.7 percent were reactors and an equal number were suspects. A certain number of the vaccinated animals which were reactors had been immunized just before the time of testing. The inclusion of results from testing the vaccinated animals increased the percentage of reactors approximately 2 percent, from 5.0 to 6.9.

Inspection of the data in table 4 indicates the variation in the percentage of cattle reactors—and probable infection—to be found in the different localities. When the data were tested for statistical significance, the percentage of reactors encountered in the dairy-cattle townships was found to be significantly different from that found in each of the other agricultural categories. Thus, brucellosis in cattle appears to be much less a problem in some areas than in others—less especially in Steele Town-

Table 4. Cattle reactors<sup>1</sup> found in each township

Township	All cattle			Unvaccinated cattle					
	Tested	Reactors	Percent	Total			Mature females <sup>2</sup>		
				Tested	Reactors	Percent	Tested	Reactors	Percent
<i>Dairy cattle</i>									
Perry-----	1,178	105	8.9	989	55	5.6	744	53	7.1
Clinton-----	1,039	66	6.4	774	30	3.9	605	30	5.0
Winfield-----	1,295	173	13.4	1,112	139	12.5	892	129	14.5
<i>Swine breeding</i>									
Harrison-----	601	45	7.5	505	9	1.8	388	9	2.3
Prairie-----	654	25	3.8	631	17	2.7	500	12	2.4
Jackson-----	566	24	4.2	563	21	3.7	437	21	4.8
<i>Mixed husbandry</i>									
Elmore-----	955	14	1.5	955	14	1.5	739	14	1.9
Steele-----	610	12	2.0	591	3	.5	476	3	.6
Needham-----	1,020	79	7.7	879	59	6.7	643	54	8.4
Total-----	7,918	543	6.9	6,999	347	5.0	5,424	325	6.0

<sup>1</sup> At least a 4+ agglutination reading in the 1:100 dilution.

<sup>2</sup> 2 years of age or older.

<sup>3</sup> Standard errors are 0.3 percent for each of the three groups.

Table 5. Sex distribution of swine reactors<sup>1</sup> found in each township

Township	All swine			Males			Females		
	Tested	Reactors	Percent	Tested	Reactors	Percent	Tested	Reactors	Percent
<i>Dairy cattle</i>									
Perry	574	6	1.0	48	1	2.1	526	5	1.0
Clinton	301	3	1.0	17	0	0.0	284	3	1.1
Winfield	123	5	4.1	8	0	0.0	115	5	4.3
<i>Swine breeding</i>									
Harrison	822	20	2.4	53	1	1.9	769	19	2.5
Prairie	403	4	1.0	25	2	8.0	378	2	.5
Jackson	1,118	89	8.0	59	2	3.4	1,059	87	8.2
<i>Mixed husbandry</i>									
Elmore	397	5	1.3	23	0	0.0	374	5	1.3
Steele	393	31	7.9	26	0	0.0	367	31	8.4
Needham	271	14	5.2	20	4	20.0	251	10	4.0
Total	4,402	177	<sup>2</sup> 4.0	279	10	<sup>2</sup> 3.6	4,123	167	<sup>2</sup> 4.0

<sup>1</sup> At least a 4+ agglutination reading in the 1:50 dilution.

<sup>2</sup> Standard errors are 0.3 percent for all swine, 1.1 percent for males, and 0.3 percent for females.

ship than in Winfield Township, which is located in the Chicago milkshed.

Table 6. Swine suspects<sup>1</sup> found on farms having swine reactors<sup>2</sup>

Township	Total swine with agglutinins		Suspects found on farms having swine reactors	Reactors plus significant suspects <sup>3</sup>	
	Reactors	Suspects		Number	Percent
<i>Dairy cattle</i>					
Perry	6	43	5	11	1.9
Clinton	3	16	3	6	2.0
Winfield	5	10	4	9	7.3
<i>Swine breeding</i>					
Harrison	20	49	23	43	5.2
Prairie	4	22	6	10	2.5
Jackson	89	127	79	168	15.0
<i>Mixed husbandry</i>					
Elmore	5	32	5	10	2.5
Steele	31	62	49	80	20.4
Needham	14	56	26	40	14.8
Total	177	417	200	377	8.6

<sup>1</sup> Less than a 4+ agglutination reading in the 1:50 dilution and agglutination at the 1:25 dilution level.

<sup>2</sup> At least a 4+ agglutination reading in the 1:50 dilution.

<sup>3</sup> Suspects found on farms having swine reactors.

infection in this species. Control programs based on the eradication of only those animals showing a positive titer of 1:50 or higher often have failed. A certain percentage of animals manifesting lower titers will actually harbor *Brucella* and when retained may subsequently reinfect the herd, while indiscriminate disposal of all hogs reacting at this lower serum dilution level of 1:25 may result in the condemnation of many uninfected animals (3).

For these reasons, it is felt that whereas the higher titer is the more reliable index to infection in the random individual, the lower titer is more satisfactory for indicating infection in animals from herds where there are swine showing higher titers. Accordingly, the data obtained in the township surveys are further analyzed to show the number and percentage of suspects which were found on farms with swine showing higher titers (table 6). Approximately half the swine designated as suspects came from herds with swine having higher titers. When this number (200) is added to the 177 positive reactors, 377 or 8.6 percent of the total swine tested might well be considered as possibly harboring the infective organism.

#### *Other Farm Animals*

Other farm animals tested numbered 1,053: 671 sheep, 354 horses and mules, and 28 goats. None of the goats reacted. Of the sheep, 5 (0.7 percent) were positive reactors and 14 (2.1 percent) were suspicious. Of the horses and mules, 9 (2.5 percent) reacted positively, while 43 (12.1 percent) were considered suspects. The terms "reactor" and "suspect" are defined the same as previously for cattle.

#### *Farms with Reactors*

In obtaining specimens from the livestock, Bureau of Animal Industry field crews visited 930 farms. It is estimated that the livestock on approximately 75 percent of the premises in the nine areas were surveyed. One or more animal reactors were found on 260 (28.0 percent) of the farms. Nine farms (1.0 percent) harbored horse or mule reactors and 5 (0.5 percent) harbored sheep reactors. There was none with reacting goats. The township distribution of premises with cattle and swine reactors is given

in table 7. It can be seen from these figures that the exclusion of data collected from farms having vaccinated animals reduces approximately 5 percent the number of farms with cattle reactors.

The infrequent occurrence of both cattle and swine reactors on the same premises is of interest. Considering only those farms having all unvaccinated animals (849), cattle reactors were found on 135 (15.9 percent). On the other hand, reactor or suspect swine, or both, were detected on only 35 of the 135 premises, although nearly all farms having a cattle reactor also had swine tested on the premises. Actually, only 6 (0.7 percent) of the 849 farms possessed both a cattle reactor and a swine reactor. The other 29 farms had only swine suspects.

In some townships a few large, heavily stocked farms accounted for a large percentage of the reactors. These data have not been presented because total animal counts were not obtained on all farms. However, there definitely appeared to be a direct relationship between the number of animals tested on a farm and the percentage of farms with animal reactors. When results from those farms which had vaccinated cattle on their premises were excluded from the data and when the remaining farms were tabulated according to the number of animals tested on each and a grouped frequency distribution table made, it was found that the number of farms with reactors increased with the indicated increase in herd size. Only 0.3 percent of the farms having 1-5 animals tested had swine reactors and 4.8 percent had cattle reactors whereas 27.4 percent of the farms having over 25 animals tested had swine reactors and 31 percent had cattle reactors. The other step intervals showed gradations between these two extremes. These results are consistent with those of many investigators.

In table 8, the proportion of farms with reactors and the percentage of reactors found in the various species have been related with respect to the three types of agricultural areas.

#### **Discussion**

Despite the fact that percentages of cattle and swine reactors varied from one township to

another, the percentages of human reactors remained fairly constant. An inspection of the data does not indicate any direct correlation between prevalence of animal and human agglutination titers.

In attempting an explanation for these results, consideration must be given to several possibly significant factors. Serology itself is a cumulative index of past experiences which differ fundamentally in the relatively stable rural population and in the constantly changing livestock. Furthermore, titers resulting from exposure to the animals surveyed cannot be differentiated from titers resulting from contact with previously owned animals. Although there may exist a direct correlation between the incidence of new infections in human and animal populations, this study would not necessarily reveal such a relationship.

Animal contacts are largely determined by regional agricultural practices and vary from one locality to another or even from farm to farm. Virulence of *Brucella* strains are different. Consequently, a farm with many in-

fected swine or beef cattle raised for commercial markets may not constitute the exposure provided by a single milk cow, hog, or possibly a riding horse infected with a more virulent strain of *Brucella*. It is possible that these interrelated factors may have operated to produce fairly uniform serologic patterns in man and not in the livestock.

It should be further mentioned that a sampling error in the human testing may exist. Since the blood specimens were collected at a designated testing station in each township, persons confined to their living quarters were not surveyed. This would mean that any acutely ill brucellosis cases were not tested. However, in view of the variety of diseases occurring in a population group during the winter months, it does not seem very probable that the ratio of acute brucellosis cases to the composite of other disease would have been so abnormally high as to alter the findings significantly. Inspection of the data does not indicate an unduly poor response on the part of any age or sex group to account for the small

Table 7. Number and percentage of surveyed farms with animal reactors

Township	Farms surveyed	Farms with reactors <sup>1</sup>							
		All species		Cattle				Swine	
				Total		Unvaccinated			
		Number	Percent	Number	Percent	Number	Percent <sup>2</sup>	Number	Percent
<i>Dairy cattle</i>									
Perry-----	137	43	31.4	43	31.4	23	20.7	4	2.9
Clinton-----	79	27	34.2	25	31.6	10	16.9	2	2.5
Winfield-----	88	50	56.8	48	54.5	34	45.9	5	5.7
<i>Swine breeding</i>									
Harrison-----	63	22	34.9	11	17.5	8	13.3	11	17.5
Prairie-----	92	18	19.6	15	16.3	12	13.5	4	4.3
Jackson-----	75	33	44.0	12	16.0	11	14.9	19	25.3
<i>Mixed husbandry</i>									
Elmore-----	161	15	9.3	11	6.8	11	6.8	5	3.1
Steele-----	115	10	8.7	4	3.5	3	2.7	6	5.2
Needham-----	120	42	35.0	31	25.8	23	21.1	8	6.7
Total-----	930	260	28.0	200	21.5	135	15.9	64	6.9

<sup>1</sup> Swine readings are 4+ agglutination in 1:50 dilution; other animals, 4+ in 1:100 dilution.

<sup>2</sup> Percentage of those farms which had no vaccinated animals on premises on which cattle reactors were found.

<sup>3</sup> Standard errors for each group, reading from left to right, are 1.5 percent, 1.4 percent, 1.2 percent, and 0.8 percent.

**Table 8. Summary of percentage of incidences of brucellosis serologic reactors and percentage of farms with reactors according to agricultural category of townships**

Agricultural category	Human	Cattle <sup>1</sup>	Swine	Equine	Sheep	Farms with reactors		
						All species	Unvaccinated cattle	Swine
Dairy cattle.....	1.7	7.8	1.4	3.4	0.8	39.5	27.5	3.6
Swine breeding.....	1.1	2.8	4.8	3.7	.7	31.7	13.9	14.8
General agriculture.....	2.3	3.1	4.7	1.3	0	16.9	9.7	4.8
Total.....	1.8	5.0	4.0	2.5	.7	28.0	15.9	6.9

<sup>1</sup> Unvaccinated.

number of positive reactors. There is a possibility, however, that the seasonal nature of the surveys did not take into consideration any peak occurrences of high titers which may have prevailed in Indiana during certain months.

Despite the many variables which enter into a study of this type, the importance of obtaining serologic patterns as an indication of the distribution and relationship of human and animal brucellosis should not be minimized. While the foregoing data are not conclusive with regard to the effect of animal brucellosis upon the spread of human infection, they are presented as evidence of the wide regional variation which may be found in the character of the animal reservoirs of brucellosis and further as an indication of serologic patterns which may possibly coexist in rural areas such as the ones surveyed.

### Summary

Serologic surveys for the relative prevalence of *Brucella* agglutinins in livestock and farm families were conducted in nine rural townships representing the dairy cattle, swine breeding, and general agricultural areas of Indiana.

Less than 2 percent of 2,622 residents 14 years of age or older reacted positively to some degree. The percentage of reactors was approximately the same in each of the townships.

Of 13,373 farm animals, approximately 6 percent were found to be reactors. Of the 930 farms surveyed, 28.0 percent were found to harbor livestock reactors. Four percent of the swine population, 6.9 percent of the cattle, 2.5

percent of the horses and mules, and 0.7 percent of the sheep were reactors. Ten percent of all cattle had been previously vaccinated. When results of testing these animals were excluded from the data, 5.0 percent of the cattle were reactors. These percentages varied considerably in the different townships.

If those swine suspects found on farms having hogs with higher titers were added to the number of actual reactors, then 8.6 percent of the swine population surveyed might be considered as possibly *Brucella*-infected.

### ACKNOWLEDGMENTS

Acknowledgment is made of the services of Dr. Raymond Fagan, D.V.M., epidemiology branch, and Dr. John Scruggs, D.V.M., veterinary public health section, Communicable Disease Center, Public Health Service, in coordinating the study, and of Dr. Thurman B. Rice and Kathleen Gay Harper, Indiana State Board of Health, in promoting the program and compiling the data.

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# Health Services and Juvenile Delinquency

By MARTHA M. ELIOT, M.D.

*In the February 1953 issue of Public Health Reports (p. 186) Dr. Martha M. Eliot states that the Children's Bureau is devoting major attention to the serious problem of getting more effective treatment for juvenile delinquents.*

*Her paper in this issue touches upon the close relationship between child health and child welfare, and between health services and social services. In this same issue, beginning on p. 578, Dr. George E. Gardner discusses three typical cases of juvenile delinquency referred to a psychiatric clinic by a juvenile court.*

*The Children's Bureau has already enlisted the interest of a wide range of juvenile experts and national and community groups in its special juvenile delinquency conferences on juvenile courts, training schools, and training of personnel to work with delinquent children.*

THE MANY WAYS in which the health services have contact with children and influence their behavior need no comment, but perhaps the importance of this relationship so far as reducing juvenile delinquency is concerned does need to be explored. I believe the health services have a major role to play in efforts to solve this problem. Through the usual maternal and child health services, and in other ways, they are in a position to make a significant contribution to programs aimed at preventing juvenile delinquency; through mental health programs for children, such as child guidance clinics, they may aid materially the work of courts and institutions offering treat-

ment to children who have already become delinquent.

The necessity for such programs cannot be stressed too greatly. More than a million boys and girls were picked up by the police in 1951 because of delinquent behavior. About 350,000 youngsters were brought before juvenile courts. Between 1948 and 1951, the number of children coming before the juvenile courts that report to the Children's Bureau increased 17 percent (see fig. 1). However, the number of children in the United States in the principal age group affected (10 to 17) increased only 5 percent. During this period, then, the delinquency rate increased faster than the rate for the particular child population category.

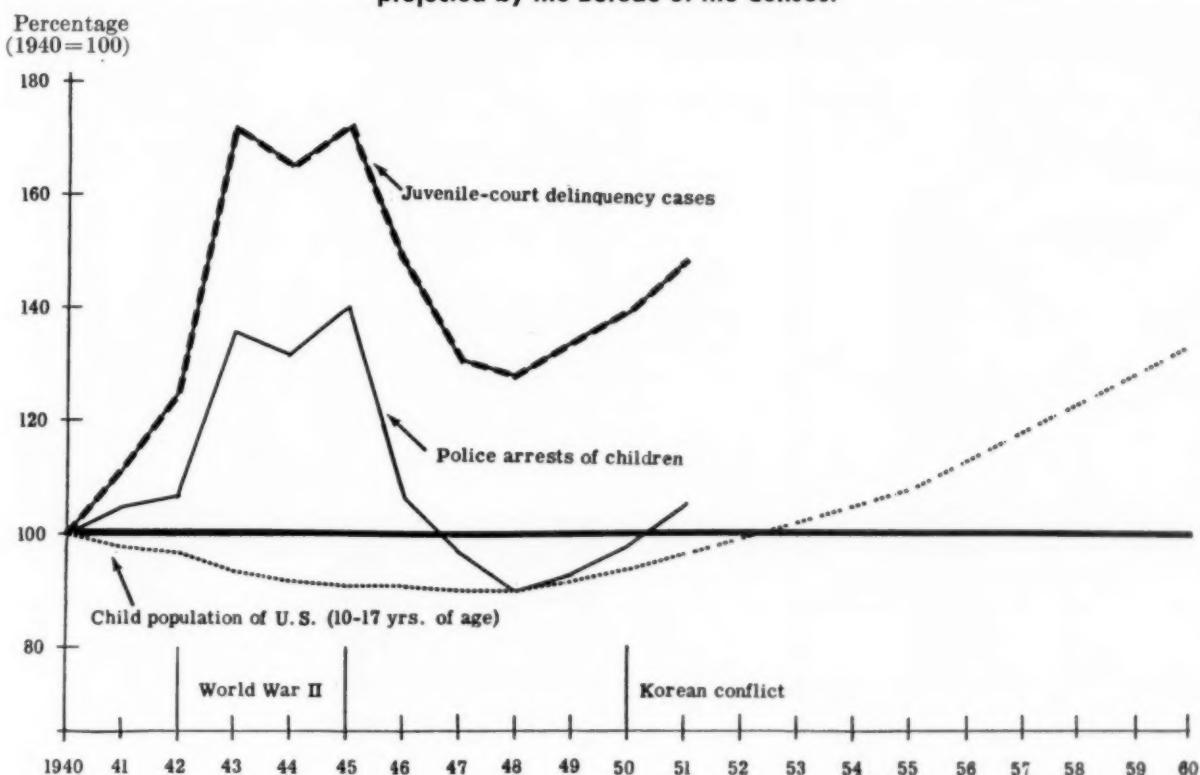
Thus, even now hundreds of thousands of delinquent children require prompt and sound treatment if they are to be prevented from continuing in careers of delinquency and crime. Those who are coming to the attention of the police and the courts for the first time should have this treatment early. For most of these there would be more hope of satisfactory re-

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*Prior to her appointment as chief of the Children's Bureau in September 1951, Dr. Martha M. Eliot was assistant director-general of the World Health Organization for 2 years. As assistant chief in 1934 and associate chief in 1941, Dr. Eliot headed the Children's Bureau health and medical services.*

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**Figure 1. Juvenile delinquency is rising. Estimated child population (10-17 years) for 1951-60 projected by the Bureau of the Census.**



habilitation if prompt help were available than for those who have repeatedly been before the courts.

At the same time, preparation for an additional load of cases must be made. During the next 7 or 8 years, it is expected that there will be a tremendous increase in the age group in which most delinquent children fall, that is, the 10- to 17-year old category. The Bureau of the Census estimates that by 1960 there will be approximately 42 percent more children in this age group than there were in 1951 (see fig. 2). In other words, for every 10 boys and girls who need our attention and care now, in a few years there may be 14 or more.

We must take every precaution we can to prevent these young people from becoming delinquent, but at the same time we must realistically face the probability that some of them will get into trouble and will need proper treatment.

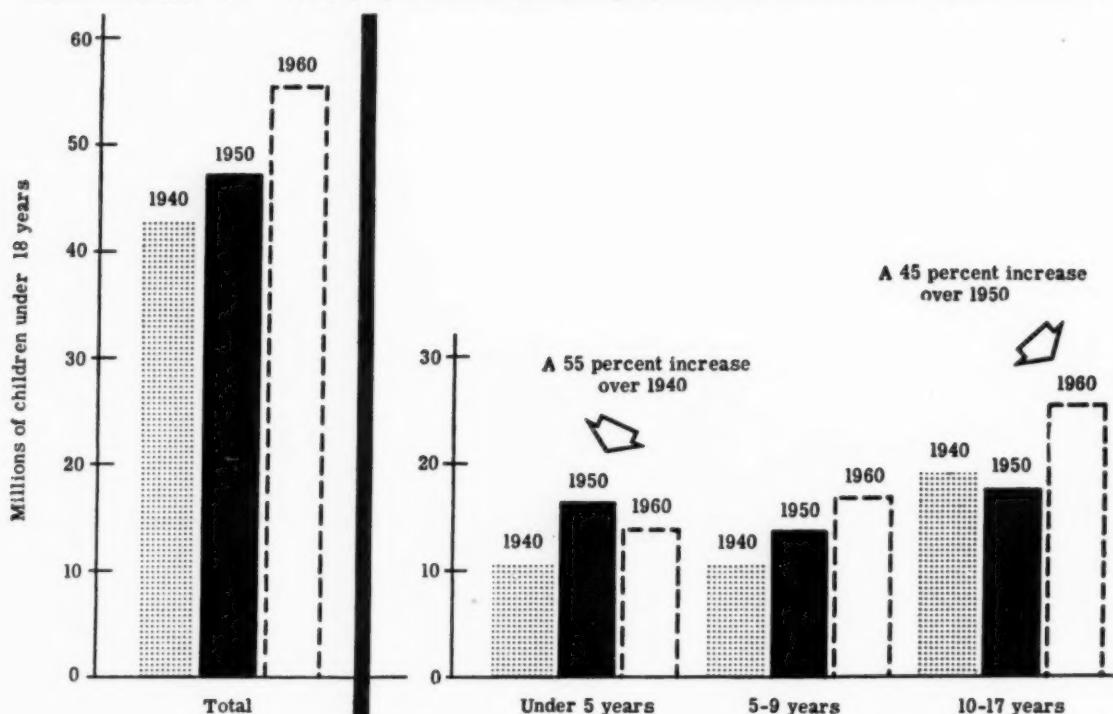
#### Focus on Local Agencies

The current program of the Children's Bureau, therefore, is to encourage communities to

do everything in their power to prevent further delinquency but not to fail to attend to the wants of those youngsters who have already become delinquent in the eyes of the law or who are on the verge of becoming so. The Bureau is recommending that communities and States strengthen certain agencies that are entrusted with the major responsibility for taking care of our young delinquents. These agencies are the police, the juvenile court, the detention home, and the training school. The Bureau is also urging that States and communities look to their administrative mechanisms that should provide focal points for coordination and integration of all the services these children need.

The experience of agencies that carry particular responsibility for treatment of delinquent children should give us sufficient warning that they need to be improved. More than one-third of the young people who come before our juvenile courts have been there previously. Even our better training schools are rarely able to claim success with more than 50 to 60 percent of the boys or girls they receive. And, of

**Figure 2. The Nation now has more children than ever before—1 of every 3 persons in the United States is under 18. 1960 population estimates projected by the Bureau of the Census.**



course, the most telling proof that our treatment programs for juvenile delinquents are not successful is the fact that the large majority of our present-day adult criminals started out as known juvenile delinquents.

The reasons for these failures are fairly evident. To give each delinquent young person the kind of treatment he may need is at best a difficult job. With the handicaps and lack of support they encounter, the agencies handling such youngsters for the most part can only make a rough attempt at treatment and rehabilitation.

#### Community Support

For example, more than half the counties in the United States offer no probation service for delinquent children. A juvenile court judge cannot do very much for a boy or girl if the court lacks a trained probation staff and competent community workers to supervise the children placed on probation and to help them adjust themselves.

In addition, each year thousands of young people are held in jail while the police or court make up their minds what to do with them. A

large number of our jails are unfit for any sort of human occupation. The Federal Bureau of Prisons has been able to authorize use for adults of less than one-fourth the more than 3,000 city and county jails it has inspected. The effect of placing a frightened, insecure, and impressionable young boy or girl in a filthy cell among the casual population of some of our jails can well be imagined. Yet it happens every day. Communities are failing to provide proper facilities for those delinquent children who require temporary detention.

A catalog of failures and reasons for failure that would stretch on to great length could be compiled. But the point has been made: If community agencies are to be counted on for offering adequate treatment to young delinquents, they must be given adequate support. These agencies don't know all the answers, but they are often successful under most difficult circumstances. Given more and better trained personnel and proper physical equipment, they can do a far better job than they are presently doing. If they were given the opportunity to study methods and results, major improvements in treatment and results might be expected.

As to prevention of future delinquency, the challenge is a tremendous one. Needless to say, it involves every agency in the community.

The best way to prevent children from becoming delinquent would seem to be to make their home and community life attractive, and socially and emotionally satisfying to them. Most of the delinquent children known to our juvenile courts are from broken and economically insecure homes. Many are members of minority races that suffer economic and social restrictions and discrimination. Yet there are many also that come from well-to-do families which have been able to offer educational and other advantages to their children which families less well off economically may lack. Lack of parental understanding, of warm parent-child relationships, or of satisfactory living arrangements or group relationships in the community often seems to be at the root of the delinquent behavior of such children. With all these contributing factors, then, and with no single factor that can be isolated as the unique cause of delinquency, it is apparent that our programs of prevention must have many facets. In these, health agencies have an important role.

Any real attempt to prevent asocial or delinquent behavior must begin early, and must be based on thorough understanding of the phases of a child's emotional and social development and the factors in family and community life that affect it. Studies of large groups of known delinquent children by Drs. Sheldon and Eleanor Glueck have shown that although the majority of these children did not become officially known as delinquents until the period of adolescence, at least half of them had histories of delinquency extending back to their eighth year or earlier.

#### **Influence of Health Worker**

In this realm of prevention, public and voluntary health services can make great contributions, particularly through child health and mental health programs. Their influence here can be exerted early and through many channels. Some contacts will be direct with families; others, indirect, through joint community activities with other agencies and individual workers.

The direct contact for public health workers ordinarily occurs in maternity clinics, child health conferences, schools, community health centers, and in similar activities. Doctors, nurses, and other health specialists see practically all children and their parents, at one time or another, in private practice or in health clinics. They see them most frequently when the children are still in their formative years. Some of these meetings are admittedly brief. There may not be time to discover deep emotional problems that might be troubling a parent or a child. The public health nurse may have more opportunity and more time to learn from the mother when she visits in the home, or from the teacher in school. But, if child health services are well conducted, time will be found to make important contributions to the emotional, as well as the physical, well-being of a child. As Dr. Benjamin Spock pointed out for the fact-finding group on health services at the Midcentury White House Conference, even in fleeting contacts, doctors, nurses, nutritionists, and other specialists have real opportunities to help make parents feel proud and confident and eager to gain understanding of their child and to help make a child feel that someone is interested in him and understands him, that here is someone to whom he can turn for help if need be.

Indirectly health experts often influence a child's growth and development through the contacts they have with persons in the community other than the parents. For adolescent children this may be even more effective than working with the child's parents or even with the child himself. Often a teacher, a recreation leader, a social worker, a church worker, a club leader may have the most influence on such a child. A health expert with knowledge and understanding of a boy's or girl's problems in growing up and with skill in handling individual situations may be able to reach far more children by working with teachers, for example, than he could by contact with individual children.

#### *Mental Health Clinic*

Among the public and private health agencies well fitted to offer this kind of educational service is the child guidance clinic or community

mental health clinic. The basic staff of this kind of clinic usually consists of a psychiatrist, a psychologist, and a psychiatric social worker. These are people who could conduct discussion groups, give lectures, write simple material for distribution. But too few of our mental health clinics actually do offer this kind of preventive service to other community agencies; too few, indeed, are equipped to handle the demands for help with delinquent children. In fact, many communities—and even some entire States—have no such clinic even for the treatment of individual children. This is a serious lack in any community, but it is particularly serious when a juvenile court judge needs the help of a psychiatric diagnosis in planning treatment for a child.

Every effort should be made to increase the number of child guidance clinics so that their facilities may be available to all juvenile courts and institutions offering treatment to delinquent children. Community health workers can be influential in getting community action of this sort.

Community health workers can help with other problems that confront workers in the juvenile delinquency field. There are the mentally defective delinquent children who may be sent to training schools for delinquent boys and girls because the schools for care of mentally defective children are not equipped to meet their needs if they commit acts contrary to law. They should not be mixed up in training schools with delinquents whose mental development is normal. So, too, epileptic children should not be committed to training schools. The problems of young unmarried mothers whose babies are born while they are in training schools also demand close attention by health workers. Health officers may have powers to condemn detention facilities, even jails, when they are unsanitary firetraps.

#### *Improved Housing*

Another possible activity of health services that relates indirectly to the prevention of juvenile delinquency is the improvement of housing. Here is a place where health, welfare, education, and housing authorities and voluntary organizations can combine their activities and

be of great influence. In many cities, the health department is in charge of housing inspection—to see that people are not living in unsafe or unsanitary quarters.

As a positive measure related to this work, some health departments and other interested groups encourage citizens to improve their own neighborhoods by their own efforts. Groups of citizens working together can go far in providing play and recreation space; cleaning up littered vacant lots; making gardens out of back-of-the-house eyesores; painting inside and out, and thereby creating new and better relations with their neighbors; and providing new opportunities for recreational activities for neighborhood groups or gangs of children. In some instances, of course, a neighborhood may be so run-down that nothing short of total reconstruction will suffice. But, however it is accomplished, a change for the good in the appearance of a neighborhood is usually a change for the good in the life of the children of that neighborhood.

#### **Focus on Problem Families**

At a recent meeting in New York of representatives of health agencies, Dr. Thomas Dublin, executive director of the National Health Council, pointed out that health problems and social adjustment problems occur quite commonly in combination. Dr. Dublin referred particularly to the findings of the St. Paul, Minn., study made in November 1948 by Community Research Associates—it is published as "Community Planning for Human Services." The study found that a group of less than 7 percent of the city's total number of families was absorbing 46 percent of the community's health services and 55 percent of the community's adjustment services offered by correctional, mental hygiene, and case-work agencies. The results of other studies lend substance to this finding.

These groups of "problem families" in our communities offer a focal point for work not only of the health agencies but also of all our social welfare, educational, and law enforcement agencies. Why these families have such knotty problems and why they continue to have them even after great amounts of money and

energy have been expended in their behalf are questions that have baffled students of our social and economic life. Contributions to our knowledge of causes of family breakdown will, we hope, bring to light factors in the causation of juvenile delinquency. Prolonged and multi-professional types of social research, both basic

and applied, must go forward to help us sort out the more significant factors from the less, and allow us to understand the influence of social and cultural as well as of economic factors that apparently play such important roles in the warping of the lives of many children and young people.

## *In Departmental Periodicals . . .*

### **OCCUPATIONAL HEALTH**

#### **Health Hazards and Health Examinations**

Are shoe-fitting fluoroscopes a health hazard? The May 1953 issue of *Occupational Health* quotes excerpts from a report on radiation exposure in New York State shoe stores. Sample findings and conclusions are: Shoe-fitting fluoroscopes were used only in stores selling children's shoes. . . . The growing child is known to be unusually susceptible to radiation effects. . . . Technical evaluation of the design, maintenance, shielding, and operation of the equipment revealed wide variations in exposure to radiation from different machines—even in machines made by a single manufacturer. . . . Education of the parent and the shoe clerk is essential. . . . The major hurdle is to keep shoe stores under proper surveillance so as to provide adequate protection for the shoe clerks and customers.

The industrial use of X-ray, fluoroscopy, and radioactive isotopes is no longer uncommon. Dr. Mitchell R. Zavon, in listing current industrial uses of radiation, suggests that the industrial physician consider the sources of hazard to which the worker may be exposed, one of which, ionizing radiation, "has become an increasing hazard not be-

cause of decreased regard for the possible danger involved but rather because of the increase in potential exposure."

#### **The Industrial Nurse**

The first nurse was employed in industry 50 years ago. Today, there are 14,000, but most have been in industry only a year. Many industrial nurses are excluded from active participation in industrial safety programs, contends Myrtle Montgomery who also asks: How can the industrial nurse recognize the medical importance of the complaints she treats when so often she is caught in the emergency demands of the first-aid room? The average industry assumes she is qualified to aid in preventing diseases and injuries, to aid in keeping employees well, and to educate them in good health, safety, and hygiene. Also, management sometimes places her in a position of unwittingly practicing medicine by expecting her to reduce medical case frequency costs in the absence of supervising physicians.

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# Psychiatric Referrals for Delinquent Children

By GEORGE E. GARDNER, Ph.D., M.D.

THE PSYCHIATRIST feels that whenever the situation surrounding the delinquent child at the moment—his reality situation—does not account for the child's antisocial behavior, his behavior probably has roots in some internal conflict, and the child probably needs psychiatric help. If the delinquency just doesn't make sense either from the standpoint of the act itself or from the standpoint of the seeming lack of necessity on the part of the child to act in that manner, or from both standpoints, the delinquency looks suspiciously like a neurotic act.

This general definition is as significant in the great number of cases it excludes from the psychiatrist's concern as in the small number of cases it indicates need special help.

## Types of Cases

On the basis of this definition, let us list a group of specific cases which are seen from time to time and on which both the psychiatrist and the juvenile court judge can agree. The list is tentative, is based on clinical observation, and does not arise from any elaborate all-inclusive theory about the fundamental nature of juvenile crime.

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*Dr. Gardner, director of the Judge Baker Guidance Center in Boston, presented this paper in more detail to the conference of the Surgeon General, Public Health Service, and the Chief of the Children's Bureau, with State and Territorial health officers, State mental health authorities, and representatives of the State hospital survey and construction agencies on December 9, 1952. Dr. Gardner is also editor of the American Journal of Orthopsychiatry.*

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*The sex offender.* Children brought to court for lewd practices, heterosexual, homosexual, or other abnormal sex activity have been referred to the psychiatrist ever since the latter has concerned himself with delinquent problems. The psychiatrist is occasionally confronted with cases where, because of some experience in the child's early life, other crimes, notably stealing, have become linked to the drive for sexual gratification. The only hint I know that may be of value to the judge and his associates in detecting such an emotional hookup is the senselessness of the act or suspicions about the role of the child's associates.

*The runaway child who has committed no other offense.* The child who runs away may be running from some intolerable home situation characterized by abuse, maltreatment, hunger, extreme deprivation. If so, the reality situation alone may account for his behavior, and no psychiatric treatment is necessary. However, the court and the psychiatrist have seen so many instances where the child has not run away in the face of the most inhuman treatment from parents, foster parents, and siblings that both the judge and the psychiatrist should be suspicious of some internal conflict when dealing with the runaway. It is my opinion that all runaways should have the benefit of at least a few interviews with the psychiatrist before we ascribe the act to the reality situation alone and thus content ourselves with merely changing the external forces surrounding the child.

*Truancy unassociated with other delinquency in a child of normal intelligence.* The child who has the innate ability to advance grade by grade with his fellows but refuses to attend school probably absents himself because of some

personality defect. He is unhappy and probably is so not because of some superficial difficulty with a particular teacher or classmate. He should have help to appreciate and re-evaluate his own problems.

*The solitary delinquent.* The child who steals or commits other offenses alone should be referred for psychiatric treatment. Because we know that children almost invariably steal with one or more children as partners, we are suspicious of the personality makeup of those few children who steal alone, and thus, we feel that at least a psychiatric investigation should be made. This refers principally to cases where the theft is committed outside the child's own home.

*The child surrendered to the court for stubbornness.* A child who confines his antisocial behavior, aggression, and unmanageableness to his home probably should be studied by the psychiatrist. A thorough investigation of the intrafamilial reactions as they affect him and in turn determine his behavior is needed. This presupposes a program of study and treatment that may extend to other members of the family.

*The delinquent of superior intelligence.* Since the formulation and widespread use of standard measures of intelligence, we no longer believe that delinquency is due solely to mental incompetency or to a moral degeneration which is attributable to lack of intellect. On the contrary, we know that most delinquents have average intelligence as measured by age level tests. Frequently, boys of definitely superior intelligence with an intelligence quotient above 115 appear before us. We feel that psychiatric investigation and treatment are indicated for all. Perhaps this is due to a persistence of the obverse of our notion that crime should not exist in the presence of superior ability, or perhaps we are moved by our feeling that here is a boy whose contribution to society may be outstanding if we can but straighten him out. Whatever may be our true motivation in these referrals, it would seem that the nonattainment of mature social standards in a boy of superior intellect is probably due to an emotional factor, preventing him from incorporating adult standards and principles. Hence, we refer him for psychiatric treatment.

*Cases where the possibility of organic brain*

*damage, psychosis, convulsive disorder, or feeble-mindedness exists.* Postencephalitic cases and children suspected of congenital or acquired syphilitic infections should be referred to the psychiatrist, who can by examination establish or rule out these conditions and outline the best medical or medico-educational program to be followed.

From observation of delinquents appearing before the court, I estimate that 5 to 7 percent of all court cases would fall into one or more of these categories. This may appear to be a very small number of delinquents referable to the psychiatric clinic, but these, except for the last group, are cases referred for psychiatric treatment, not for diagnosis only, and they do not include the cases involving stealing. The need for facilities to determine accurately which children do need treatment, including psychiatric treatment, is a serious one.

### Clinical Conference

Let us hold a psychiatric clinic on three cases all charged with stealing, the most frequent delinquent offense. These cases are cited to emphasize the varying psychiatric needs of delinquent children. They demonstrate a gradient which runs from cases where the detrimental external factors almost alone can account for the delinquency to those expressions in behavior, as in the third case, that seem to have no reference whatsoever to present economic or social inadequacies. In considering these cases, we can discern the relative psychiatric treatment needs or their absence.

### A CLASSICAL CASE

Frank at 13 is before the juvenile court for the eighth time, on a fourth charge of stealing. He steals money or anything convertible into money, using it to buy candy, attend movies, treat his friends. He steals alone or with others. He has already been in a correctional school for a year.

Frank lives with his mother, maternal grandmother who is blind and feeble, 5 sisters, and 3 brothers in a poorly furnished 6-room apartment in a fairly poor residential area.

The father has been before the courts 20 times in the past 20 years on charges of assault and battery, drunkenness, stealing, nonsupport, and threatening

his wife. The mother has been in court once for adultery. One older brother has been in juvenile court 14 times and twice in reform school. His charges were breaking and entering, larceny, malicious destruction of property, and truancy. Another brother has been in juvenile court twice for truancy and for larceny.

Frank's mother claims that her mother and the older daughters supervise the children in her absence, although supervision is apparently slight. The mother was separated from her husband 8 months ago. Sometimes there is not enough to eat.

Frank occasionally attends the local community house and church. He enjoys football somewhat but spends his time when at home reading comic books and crime magazines. He hangs around undesirable areas of the city.

Frank entered kindergarten at 5, repeated the first grade, and is now repeating the eighth. His marks are mainly C's and D's. He is occasionally truant or absent.

An observer at a local boys' club sees Frank as an "extremely thin, dirty, and unkempt appearing boy" but quiet, cooperative, and a good competitor, appearing to like athletics although lacking the physical qualifications for rugged, competitive work in the gymnasium.

Frank himself gives no reason for his behavior except that he gets in with the wrong boys. He adds that all boys in his neighborhood steal and that it was unfortunate he was caught. He repeatedly asserts his good intentions but finds he is unable to carry them out. He blames only himself.

Here is the classical case of delinquency arising in a home and community devoted to delinquent behavior—a broken home, poor economic conditions, mother working, little or no supervision of children, father a drunkard and criminal, mother known to the courts, and two delinquent brothers. Presumably, the role of neurotic strivings is minimized in importance by the more or less expected rational response to such admittedly adverse social and parental relationships. Obviously, only an intensive psychotherapeutic approach would reveal the primary gains so well overshadowed. The failure of repeated attempts at rehabilitation through manipulative procedures emphasizes that there are cases of stealing where the irrational, the patternized-repetitive—almost

compulsive—features are on the surface nonapparent and seem to be nonoperative as the all-important portion of the atypical behavior.

#### SUPERIOR INTELLIGENCE

Charles, 15, is before the court on four complaints of breaking and entering. At 10, he broke into an empty shed, but charges were never pressed, and the case was dropped.

Family history reveals that his parents had a stormy marital career. The father was convicted of a series of thefts and sentenced to prison when the boy was a baby. When Charles was 5, the father was paroled but was sentenced for 20 years after breaking the parole and is still in prison. The mother had difficulty in making ends meet, and moderate deprivations existed. She has always worked, and the boy has been supervised by relatives or friends. When Charles was 6, she divorced her husband and subsequently remarried.

Charles is now repeating the eighth grade. He repeated the seventh. This is his fourth year in junior high school. On the revised Stanford-Binet intelligence test, Charles has a mental age of 17 years, 11 months, and an IQ of 124, indicating superior intelligence.

A review of Charles' stealing episodes reveals that he acquired no money, nor did he receive any of the stolen goods which were taken by the other boys involved. He said he didn't want them. Each instance of stealing was in the company of other boys, all known to Charles to have juvenile court records. Charles never stole from home.

Charles does not want an education but wishes to work in the merchant marine because "they are a bunch of hoboes. I like them. There are no bosses. You can go anywhere you want to go when you want to go."

His only school interest is in art work. He says, "I draw cartoons." When asked for a sample sketch, he draws a cigarette-smoking, tough-looking man wearing a striped shirt with a turtle-neck collar. The man has a patched face and wears a derby hat. Charles calls him a cartoon character. He has no cartoon plot, but has many pictures and will bring them in. When we try to arrange for art classes, he says, "They probably make you draw things you don't want to." When asked if his cartoon is a sad, happy, or funny character, Charles replies, "He is a tough guy, but he is an all right one underneath." He brings in more cartoons which are pictures of

thugs and men with beaten-up faces. One scene depicts a man who has hung himself in jail, he says. Other pictures show prize fighters in various fighting positions.

His companions are inevitably those with court records. He walks 2½ miles from home to play with a boy on probation, and on the way passes many schoolmates who have never been in trouble. He has nothing against the latter but wants to play with boys who have been in trouble.

Charles wants a part-time job, not only because he feels it is a way of finally breaking away from school but also because he wants to earn money for his mother to give her some of the fun she has missed. It will also show his stepfather that he can contribute to the mother's support too.

We find a subtle combination of actual deprivations in early life and neurotic strivings expressed in stealing and allied delinquent acts. The all-consuming drive behind the boy's delinquency seems to be that he feels he must be a criminal like his father, or that he is not to succeed where his father failed. He deliberately tries to destroy himself in the community by his delinquencies, in school by an educational block, and his heart is set upon a vocation that will enable him to be a bum. His drawings bear out his ambitions and his fears in relation to this drive.

Other facts demonstrated that these self-directed tendencies toward failure and destruction were secondary to aggressive tendencies directed toward the father.

#### INSTINCTUAL DRIVES

Albert exemplifies the extreme end of our comparative scale of boys who steal in that the secondary material gains seem to feature little or not at all as motivating factors, and the neurotic ones seem to be all-powerful.

Albert is 16. His parents can supply the needs and luxuries of a boy of his age in his community. His father died when Albert was 5, and his mother remarried when he was 10. Albert has superior intelligence and is now in the third year in high school despite having been removed from several schools because of stealing.

When he was 8, his mother discovered clothes in his room taken from her closet. She scolded; he seemed upset; and she assumed the problem

dropped. Periodically, Albert has broken into neighborhood houses and stolen women's clothes.

On interview, Albert says, "I say I will stop, but the next day I do it. I've been taken out of schools because of it. I began stealing women's clothes when I was 6 or 7 years old. I just liked to get dressed up in this thing, and mother caught me in it, and she stopped me. I had the door locked. She took it away and hid it. Later, I found it again, dressed up in it, and she caught me again. I cried and put on my own clothes. Then it stopped for about 3 years. It started again as I finished the sixth grade. I suddenly got this urge again to wear women's clothes."

Little comment is needed to emphasize the obvious neurotic elements in this case which stands in contrast to the other 2 cases of stealing, each of the 3 taking its proper place along a scale of increasing psychiatric importance. In addition, it is easy to understand where the primary neurotic gains in such a case are uppermost—even to the seeming exclusion of secondary or material gains. In such cases manipulative procedures or changes in the environmental (economic or social) setup would have no effect whatsoever on the impulse to steal. Only insight derived from self-study under guidance offers hope for a redirection of these instinctual drives.

#### Psychiatric Needs

From this brief survey, we can make certain hypotheses:

1. All delinquent children need treatment of some kind whether medical, psychiatric, educational, placement, supervision—or new shoes and clothes and proper food.
2. All delinquent children do not need psychiatric treatment.
3. Although all delinquent children may not need intensive psychiatric treatment, all delinquent children need a psychiatric diagnosis first of all to determine accurately whether psychiatric treatment is needed. Psychiatric diagnosis means more than a test of intelligence and a physical examination.

Because of the shortage of trained psychiatrists and of the even more acute shortages of trained child psychiatrists the minimal diagnostic and minimal treatment needs of delin-

quent children are not being met. Needed are more psychiatric training facilities and the placement of psychiatric personnel within the court structure once they are trained.

Other needs in this area of psychiatric treatment are equally serious:

Residence centers—not detention homes—where adequate care and thorough medical, psychological, and sociological studies can be made, are needed for preliminary diagnoses of children who cannot be kept at home during their preadjudication period.

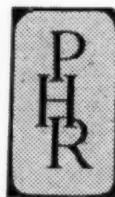
Schools and hospitals geared to long-term intensive residence treatment of delinquent

boys and girls are desperately needed. We particularly need foster home and residence treatment centers and programs for delinquent girls and for Negro children of both sexes.

Only under such conditions can we be assured that the proper medicosocial treatment programs for delinquent children will even approximate the best form of comprehensive child care.

NOTE: Portions of this paper have appeared in G. E. Gardner's "The Psychiatrist's Role in the Treatment of the Delinquent," Yearbook of the National Probation Association, 1940: and in his "Primary and Secondary Gains in Stealing," *The Nervous Child*, vol. 6, October 1947.

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# Studies on Dental Care Services For School Children

— *First and Second Treatment Series, Richmond, Ind.* —

By **GEORGE E. WATERMAN, D.D.S., and JOHN W. KNUTSON, D.D.S., Dr.P.H.**

**I**N A COMPREHENSIVE analysis (1) of a dental survey of school children in Hagerstown, Md., Klein, Palmer, and Knutson distinguished between the accumulated and annual increment of dental needs. They concluded that the basic problem of caring for caries in the teeth of school children is that of caring for the annual increment.

The purpose of this report is to provide actual performance data on the accumulated and maintenance dental care needs of school children.

The Richmond study was a cooperative project of the Indiana State Board of Health, the city of Richmond, and the Public Health Service. Beginning December 23, 1946, it extended over a 5-year period.

The project was designed to give dental care services to all school children enrolled in kindergarten through the ninth grade, provided treatment was requested by their parents.

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*Dr. Waterman, assistant chief of the Division of Dental Public Health, Public Health Service, directed the dental research care program in the Richmond, Ind., schools. He is presently engaged in promoting and developing the use of auxiliary personnel in dental schools and in the dental profession.*

*Dr. Knutson, Assistant Surgeon General, is the chief dental officer of the Public Health Service.*

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Richmond was chosen for this study primarily because it provided a group of between 4,000 and 6,000 school children for a treatment and followup program, and because the project had the full approval and cooperation of the Indiana State Health Department and of dental societies and school authorities at both the State and local levels.

The city is a fairly typical midwestern community of about 40,000 people, 98 percent of whom are white and native-born. The total enrollment for all schools—kindergarten through senior high school—was 6,929 at the beginning of this study.

Situated near the eastern border of Indiana, Richmond is a railroad center and a major distribution terminal for the rich farm produce of eastern Indiana and western Ohio. It also has several small and medium-sized industries.

## Clinical Facilities and Personnel

Dental clinics were set up in each of Richmond's 16 elementary and junior high schools: 14 public and 2 parochial. Wherever possible, school authorities provided attractive clinic rooms with good lighting and ventilation.

Two modern standard dental units and chairs were available to each dentist. For each 2 chairs there was 1 dental instrument cabinet containing duplicate sets of instruments. The type and arrangement of equipment, and the

provision of adequate auxiliary personnel enabled each dentist to work from a seated position at all times. These working conditions reduced the dentist's fatigue and helped to improve the quantity and quality of his services (2, 3).

The clinics varied in size from 4 chairs for schools of 300 children or less to 6 chairs for the larger schools. Two or three clinics operated at one time. As dental treatment was completed in one school, the staff dismantled equipment and packed supplies for transportation, and in less than a day later the equipment was in use again in the next school.

Personnel for the study project included between 3 and 5 dentists, a dental health educator, a secretary, and a dental hygienist to give prophylaxis and topical fluoride treatments. In addition 1 clerk was assigned to each operating clinic, and an average of 1½ dental assistants was provided each dentist.

The 5 dental assistants employed at the start of the project underwent 10 weeks of intensive training at the Naval Dental School in Bethesda, Md. They in turn helped to train assistants added to the staff later during the study.

Inservice training was provided for the entire staff once every 3 months by 1 of 7 specialists in various phases of pedodontics and in the efficient use of auxiliary personnel.

#### Clinical Routine

Dental record cards were prepared for the entire school population from census sheets provided by the teachers of each grade. Teachers issued "request for treatment" slips to all pupils with instructions to return them signed by a parent or guardian, indicating whether or not they wanted the child's dental care provided in the school clinics.

The dental care program was divided into four consecutive treatment series. A treatment series consisted of dental examination of the total enrollment, kindergarten through junior high school, and completed treatment of all children whose parents requested treatment.

Since the majority of dental defects in any group of children results directly from dental caries, this report is concerned principally with

caries prevalence and the treatment services required to correct carious defects.

This report is limited to the first and second treatment series.

#### Examination

Complete dental examinations of all children were conducted in each school. Examinations were made with a No. 4 plain mouth mirror and sharp No. 5 double-end explorers. X-rays were used whenever there was any doubt about clinical diagnosis.

The following information was recorded in examination and treatment records maintained for each child during each treatment series:

Number of primary and permanent teeth erupted and unerupted.

Number of teeth missing because of extraction.

Number of teeth missing due to other causes.

Number of roots remaining.

Number of filled and unfilled carious teeth and the surfaces involved.

Number of filled teeth and the surfaces restored.

Number of hypoplastic teeth.

Observations were made on all teeth present in the mouth. Teeth recorded as carious were those which showed actual cavities, no matter how small, as well as deep pits and fissures in which the explorer hung and penetrated with pressure.

A dental assistant recorded the information on the record cards in code to facilitate transfer to punch cards for processing and analysis. A serial number was assigned to each child for the duration of the study project. A master card index system was maintained to simplify reference to a child's previous dental record.

#### Treatment

Once the examinations had been completed, clinical treatment was given to all children whose parents had signed consent slips. A few days before treatment was started in a particular school, the children heard a brief talk by the dental health educator, who explained the importance of early and adequate dental care. He told why the clinic was coming to the school

and urged those receiving treatment in private dental offices to do so regularly. This introduction to the clinic program helped promote understanding and friendly cooperation among the children, the teachers, and the clinic staff. During actual treatment, the children received chair-side instruction in oral hygiene.

Clinics were operated on a year-round basis with appointments for treatment continuing during vacations and holidays. Young children were treated in the early forenoon and early afternoon, with treatment periods limited to 15 to 30 minutes. The late morning and late afternoon appointments were usually reserved for the older age groups. Their treatment periods varied from 20 minutes to 1 hour.

Extractions were generally avoided during a child's first dental experience. Efforts were made to complete all operative treatment in the teeth of at least 1 mouth quadrant during a single sitting. Fillings were polished as the sittings progressed.

The types of treatment included:

Permanent fillings (amalgam and silicate cement).

Restoration of fractured anterior teeth with full and partial crowns.

Vital partial pulpectomies of permanent and primary teeth.

Root canal therapy of permanent anterior teeth.

Treatment for periodontal diseases.

Prophylaxis.

Topical fluoride applications.

Polishing of fillings.

The amount and type of treatment given each child were noted on the record cards. Each dentist and dental hygienist recorded all of their clinical services on daily work sheets. At the end of each 10-day working period, these sheets were combined in a biweekly report showing an accurate running account of services performed during the study project.

#### **First Treatment Series**

A total of 5,523 children between 5 and 16 years of age, representing 96 percent of all Richmond children in kindergarten through the 9th grade, were given dental examinations. A total of 4,569, or 84 percent of the group, re-

quested and received dental treatment (see table 1).

#### *Caries Prevalence*

Since this report is concerned mainly with dental care service, baseline and performance data are limited to those children who took part in the clinical care program.

The average annual increment of decayed permanent teeth, estimated from the difference in prevalence rates at individual ages, was 1.1 teeth per child. The total estimated annual increment was 5,100 decayed permanent teeth.

To establish an adequate means of measuring and expressing workload for this dental care study, all teeth requiring fillings, whether or not they had previously been filled, are counted as "carious." Also counted as carious are teeth for which extraction is indicated. Approximately 75 percent of the children had 1 or more decayed permanent teeth. There was a total of 18,542 decayed teeth involving about 30,000 surfaces.

The age specific DMF (decayed, missing, and filled) rate of permanent teeth increased from 0.31 at age 5 to 11.47 at age 15 (see table 2 and figure 1). The average 15-year-old child had 9.42 decayed teeth, 1.72 missing teeth, and only 1.60 filled teeth.

More than 13 percent of the children had 1

**Table 1. Age distribution of all children examined, by patient status, 1st and 2d treatment series, Richmond, Ind.**

Age last birthday	1st treatment series			2d treatment series		
	Patient status		All children	Patient status		All children
	Clinic	Private		Clinic	Private	
All ages	4,569	954	5,523	4,797	798	5,595
5	565	105	670	479	69	548
6	528	110	638	574	79	653
7	507	92	599	555	64	619
8	440	89	529	524	74	598
9	495	88	583	503	63	566
10	422	75	497	457	80	537
11	358	69	427	426	70	496
12	359	72	431	347	55	402
13	370	78	448	364	88	452
14	334	86	420	331	93	424
15	161	72	233	195	47	242
16	30	18	48	42	16	58

or more missing permanent teeth, and only 17 percent had 1 or more filled permanent teeth.

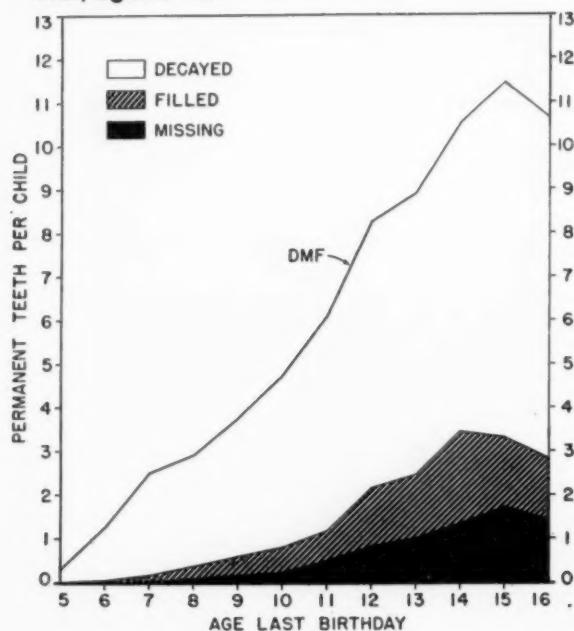
More than 34 percent of the primary teeth examined were found to be carious. The average 7-year-old had 13.58 primary teeth, of which 5.11, or more than 38 percent, were decayed (see table 3). Only 9 percent of the group had 1 or more primary teeth which had been filled prior to the first treatment series.

#### Treatment Provided

Since the first evidence of dental caries in permanent teeth is closely associated with the beginning of school attendance—at age 5 or 6—a school dental program of the type described here is ideal for caring for the annual increment of defects in permanent teeth. Such a program cannot, however, insure annual or maintenance care of primary teeth, inasmuch as caries usually begins to accumulate in these teeth before age 3. Therefore, during the first treatment series, when the main concern was to care for the accumulated defects of the permanent teeth, primary teeth received only emergency, or very selective, treatment.

Ninety percent of the clinical program group received complete dental care during the first treatment series; and 70 percent of the children

**Figure 1. Dental caries prevalence in permanent teeth, first treatment series, Richmond, Ind., ages 5-16.**



**Table 2. Dental caries prevalence in permanent teeth of children, 1st and 2d treatment series, Richmond, Ind.**

Age last birth-day	Number of teeth per child						
	Car- ious	Filled	Car- ious and/or filled	Missing			DMF
				Total	Ex- tract- ed	Ex- trac- tions indi- cated <sup>1</sup>	
1st treatment series							
5-16 <sup>2</sup>	5.08	0.83	5.58	0.61	0.37	0.24	5.95
5-----	.31	.00	.31	.00	.00	.00	.31
6-----	1.23	.04	1.26	.00	.00	.00	1.26
7-----	2.38	.14	2.48	.03	.02	.01	2.50
8-----	2.68	.28	2.88	.09	.03	.06	2.91
9-----	3.45	.42	3.71	.18	.06	.12	3.77
10-----	4.24	.56	4.60	.25	.14	.11	4.75
11-----	5.51	.67	5.90	.51	.20	.31	6.10
12-----	7.10	1.31	7.79	.84	.47	.37	8.26
13-----	7.41	1.46	8.30	1.00	.61	.39	8.90
14-----	8.36	2.11	9.67	1.34	.88	.46	10.54
15-----	9.42	1.60	10.30	1.72	1.16	.56	11.47
16-----	8.83	1.40	9.73	1.43	.90	.53	10.63
2d treatment series							
5-16 <sup>2</sup>	2.87	3.32	5.59	0.48	0.43	0.05	6.02
5-----	.17	.00	.17	.00	.00	.00	.17
6-----	1.05	.06	1.10	.00	.00	.00	1.10
7-----	2.01	.45	2.35	.00	.00	.00	2.35
8-----	2.16	1.32	3.13	.03	.02	.01	3.15
9-----	2.38	2.08	3.89	.08	.06	.02	3.95
10-----	2.78	2.67	4.83	.19	.15	.04	4.98
11-----	3.55	3.17	5.95	.25	.20	.05	6.15
12-----	4.65	3.85	7.71	.55	.44	.11	8.15
13-----	4.50	4.87	8.45	.69	.64	.05	9.09
14-----	3.80	6.79	9.49	1.01	.95	.06	10.44
15-----	3.80	7.20	9.87	1.28	1.18	.10	11.05
16-----	3.64	7.38	10.19	1.62	1.48	.14	11.67

<sup>1</sup> Also included in "Carious" and "Carious and/or filled."

<sup>2</sup> Average of the rates for ages 5-16.

treated received fillings in 1 or more permanent teeth. More than 11 percent of the children had at least 1 permanent tooth extracted.

A total of 16,015 permanent teeth were filled, at an average rate of 4.20 teeth per child for all age groups. The average 15-year-old had 7.20 teeth involving 11.69 surfaces restored (see table 4).

Selective treatment of primary teeth included 2,898 primary teeth filled, and 3,341 extractions.

In addition to teeth filled and extracted, a total of 367 pulps were capped, and 151 vital

partial pulpectomies were performed on permanent and primary teeth.

Each child received at least 1 dental prophylaxis. Topical fluoride applications totaled 12,329; a serious attempt was made to provide each child with a series of 4 topical fluoride applications.

#### Dentist Man-Hours

There was an average of 4.3 dentists on duty during the first treatment series, or a ratio of 1 dentist to 530 children treated per year. This dentist-staffing average is based on a full 65-hour, biweekly period for all dentists assigned to the project during the first treatment series with no deductions made for administrative work, vacations, illness, training, and so forth.

Dentist man-hour rates were determined from the total clinic time actually worked by all dentists during the 24 months of the first treatment series. The number of dentist man-hours required to complete treatment of each child in the first round was 2.88. The average number of permanent and primary teeth treated per dentist man-hour was 2.17. This number included 1.50 permanent teeth filled.

#### Second Treatment Series

During the second treatment series, a total of 5,595 children, 93 percent of all Richmond children in kindergarten through the 9th grade, were given dental examinations. A total of 4,797, or 86 percent of the group, elected to receive treatment in the school clinics (see table 1). This number included 1,688 who had not been enrolled in school during the first treatment series, largely kindergarten and 1st grade children.

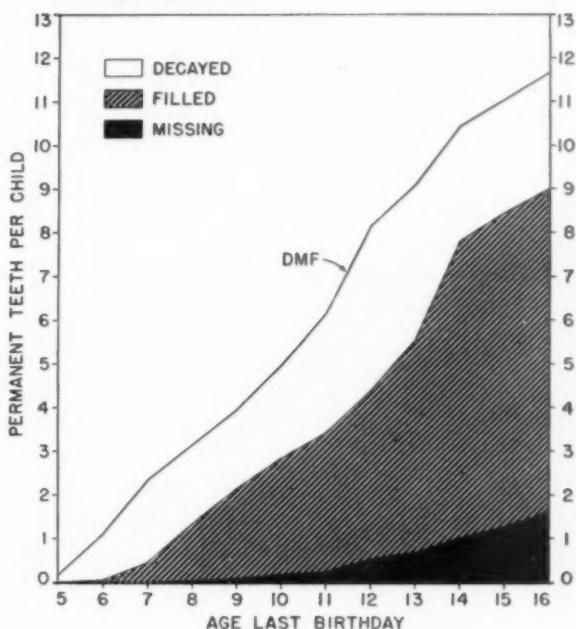
#### Caries Prevalence

Approximately 68 percent of the children had 1 or more decayed permanent teeth. There was a total of 12,523 decayed teeth, about 6,000 less than in the first treatment series.

The average annual increment of decayed permanent teeth during the interval between the beginning of the 2 rounds was 1.19 teeth per child.

The average number of untreated carious teeth per child at age 15 was 3.80 compared to

Figure 2. Dental caries prevalence in permanent teeth, second treatment series, Richmond, Ind., ages 5-16.



9.42 in the same age group in the first treatment series (see table 2 and figure 2). The average 15-year-old now had 7.20 filled teeth, whereas 24 months earlier the average had been only 1.60 for the same age group. The average DMF rates were essentially the same for all age groups in both series.

Only 167 permanent teeth were indicated for extraction in all age groups, compared to the 815 which had needed extraction during the first series. Approximately 52 percent of the children now had at least 1 filled tooth as compared with only about 16 percent at the beginning of the initial series.

There was a slight decrease in the number of carious primary teeth. The average 7-year-old had 4.75 carious primary teeth, compared to 5.11 for the same age group in the first treatment series (see table 3). This relatively slight reduction in the number of carious primary teeth can be attributed to the limited treatment provided during the first treatment series, plus the enrollment of a new crop of children in the kindergarten and first grades. During the second treatment series, however, 24 percent of the children had at least 1 filled primary tooth, compared to only 9 percent in the first round.

**Table 3. Dental caries prevalence in primary teeth of children, 1st and 2d treatment series, Richmond, Ind.**

Age last birth-day	Number of teeth per child			
	Carious	Filled	Carious and/or filled	Extractions indicated <sup>1</sup>
1st treatment series				
5-16 <sup>2</sup>	2.31	0.22	2.47	0.37
5	4.75	.37	5.02	.32
6	4.91	.52	5.28	.51
7	5.11	.43	5.41	.89
8	4.53	.48	4.90	.86
9	3.84	.47	4.21	.77
10	2.26	.17	2.37	.47
11	1.33	.11	1.38	.35
12	.59	.13	.67	.12
13	.33	.01	.34	.08
14	.07	.01	.07	.02
15	.04	.00	.04	.01
16	.00	.00	.00	.00
2d treatment series				
5-16 <sup>2</sup>	2.09	0.53	2.48	0.25
5	4.62	.40	4.90	.24
6	4.83	.94	5.52	.41
7	4.75	1.28	5.70	.53
8	3.96	1.44	4.98	.51
9	3.21	1.10	4.06	.53
10	2.09	.74	2.64	.42
11	1.03	.34	1.28	.18
12	.34	.09	.40	.07
13	.14	.03	.15	.04
14	.04	.01	.04	.02
15	.03	.00	.03	.00
16	.02	.00	.02	.00

<sup>1</sup> Also included under "Carious" and "Carious and/or filled."

<sup>2</sup> Average of the rates for ages 5-16.

#### Treatment Provided

Complete dental care was given to 98 percent of the clinical program group with 69 percent getting at least 1 permanent tooth filled. Only 2 percent of the children required any extractions.

A total of 12,354 permanent teeth were filled, at an average rate of 2.83 teeth per child for all age groups, compared to 4.20 in the first round of treatment. The average 15-year-old had 3.47 teeth restored, compared to 7.20 for the same age group 20 months earlier (see table 4).

Since the bulk of the accumulated needs had been cared for during the first treatment series,

it now becomes possible to devote more time to treating defects in primary teeth. The number of primary teeth filled rose from 2,898 in the initial round to 5,569 in the second series.

Aside from fillings and extractions, there was no substantial change in the type or amount of other dental treatment services.

#### Dentist Man-Hours

There was an average of 3.9 dentists on duty during the second treatment series, or a ratio of 1 dentist to 743 children treated per year. The number of dentist man-hours required to complete treatment of each child in the second round

**Table 4. Dental treatment to permanent and primary teeth of children, 1st and 2d treatment series, Richmond, Ind.**

Age last birthday	Number of teeth per child					
	Permanent teeth			Primary teeth		
	Filled	Filled surfaces	Extracted	Filled	Filled surfaces	Extracted
1st treatment series						
5-16 <sup>1</sup>	4.20	6.65	0.24	0.48	0.88	0.61
5	.27	.38	.00	1.38	2.51	.40
6	1.15	1.63	.00	1.31	2.52	.69
7	2.16	3.38	.02	1.21	2.23	1.21
8	2.46	4.00	.08	.98	1.79	1.33
9	3.01	4.84	.12	.49	.84	1.26
10	3.81	6.19	.21	.23	.39	.96
11	4.85	7.59	.30	.08	.13	.63
12	6.23	9.68	.36	.03	.05	.48
13	6.75	10.40	.41	.02	.03	.26
14	6.52	10.27	.43	.00	.01	.08
15	7.20	11.69	.45	.02	.03	.02
16	5.93	9.70	.53	.00	.00	.03
2d treatment series						
5-16 <sup>1</sup>	2.83	4.28	0.05	0.88	1.65	0.45
5	.18	.28	.00	2.84	5.23	.38
6	1.15	1.18	.00	2.80	5.21	.65
7	2.08	3.40	.02	2.43	4.66	.91
8	2.18	3.56	.01	1.44	2.75	.92
9	2.29	3.76	.04	.72	1.28	1.03
10	2.77	4.26	.05	.24	.43	.77
11	3.58	5.34	.05	.04	.07	.42
12	4.72	6.81	.05	.01	.01	.20
13	4.63	6.93	.08	.01	.02	.09
14	3.72	5.69	.12	.01	.03	.04
15	3.47	5.33	.10	.00	.01	.03
16	3.21	4.79	.05	.02	.05	.00

<sup>1</sup> Average of the rates for ages 5-16.

was 1.86. The average number of permanent teeth treated per dentist man-hour was about the same as in the first series. There was an increase, however, in the amount of treatment provided per dentist man-hour for primary teeth: 0.61 teeth filled as compared with 0.31. The second treatment series was completed in 20 months.

There was a reduction of 1.02 dentist man-hours in time required to complete treatment of each child. This drop may be attributed to the lower prevalence of carious teeth due to dental treatment, and improved operating and clinical procedures.

The reduction in completed dentist man-hours per child would undoubtedly have been greater except for the constant influx of children who had had little or no previous dental treatment.

### Summary

An average of 4,600 school children in kindergarten through 9th grade were given dental examinations and complete dental treatment during the first 2 treatment series of the Richmond, Ind., dental care study project.

The first treatment series was designed to care for the accumulated dental needs of the group. Primary emphasis was placed on caring for defects in permanent teeth.

The second treatment series, which started 24 months after the beginning of the first, was designed to treat the increment of defects occurring during that 24-month period, and to provide more complete care for the primary dentition.

Before the first series, only 17 percent of the children had had any permanent teeth filled. This figure rose to more than 52 percent at the start of the second series.

At the beginning of the second series, it was found that the average 15-year-old had 3.80 unfilled carious teeth, compared to 9.42 in the same age group at the start of the first series.

Only 167 permanent teeth were indicated for extraction in all age groups in the second series, compared to 815 needing extraction during the first round of treatment.

The number of dentist man-hours required to complete treatment of each child in the first and second rounds was 2.88 and 1.86, respectively. This represents a reduction of 1.02 dentist man-hours, or 35 percent, for each child.

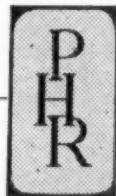
### ACKNOWLEDGMENTS

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# Adult Guidance Center, San Francisco

By MCCLAIN JOHNSTON, M.D.

WITH THE RECOGNITION of chronic alcoholism as a public health problem, more interest is being shown in public education on the subject, more legislation to establish and operate clinics and hospitals for alcoholics is being passed, and medical, socio-logical, and psychological research in this field is increasing.

Ten months after publication of a report on the extent of alcoholism in San Francisco, the city board of supervisors made a lump sum appropriation of \$50,000 for the fiscal year 1949-50 to establish an inpatient facility for treating men charged with and convicted of drunkenness. The pilot clinic opened July 15, 1949, in the hospital ward of the men's division of the San Francisco county jail. A psychiatrist, a psychiatric social worker, and a clerk-stenographer comprised the staff. During the 20½ months the pilot clinic was in operation, medical and psychiatric treatment was given to approximately 200 patients. The pilot clinic was under the direction of the City and County of San Francisco Department of Public Health.

There were definite disadvantages in attempting to treat alcoholics in a jail setting. It was felt that the problem of alcoholism could be handled better if the treatment and punitive programs were completely separate. Funds for both inpatient and outpatient facilities were not available. However, an additional \$35,000 was added to the original budget of \$50,000 to establish and maintain a voluntary

outpatient clinic which would be apart from the jail. On April 2, 1951, the Adult Guidance Center opened and the pilot clinic in the jail closed.

## Organization

The Adult Guidance Center is open 12 hours a day, 6 days a week, to accommodate patients whose work schedules might conflict with clinic attendance. A psychiatrist-director, 4 psychiatrists, 3 psychiatric social workers, 2 nurses, and 3 stenographers make up the staff. The 4 psychiatrists and 1 of the nurses are on a half-time basis. All services are free. The clinic is a bureau of the City and County of San Francisco Department of Public Health. The budget for the fiscal year 1952-53 is \$75,000.

The psychiatrists on the staff interview and evaluate new cases coming for treatment, make progress notes on the active cases who receive medical treatment only, and see cases in psychotherapy. The duties of the social workers fall into three major areas: intake-interviewing on new cases, liaison with other agencies about individual cases, and the carrying of cases in psychotherapy. The nurses administer medication, and make progress notes on cases receiving medical treatment only, when the psychiatrist on duty is interviewing a patient.

Two staff meetings are held weekly: one is for case presentation; and the other is an administrative meeting where general policy, procedural changes, and clinic problems are discussed. Each social worker has a weekly supervisory conference with the director to discuss problem cases or to review psychotherapeutic interviews.

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*Dr. Johnston, a psychiatrist, is the full-time director of the Adult Guidance Center, a bureau of the City and County of San Francisco Department of Public Health.*

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## Admission

Each new patient must live in the city and county of San Francisco. He must be "dry" for 24 hours prior to admission. He must feel that he has a drinking problem. Under this criterion, we require only that the patient come to the clinic voluntarily with the realization that his drinking is causing some problem in his day-to-day living. Not all patients are chronic alcoholics in the usual sense of the expression. Many state they are not alcoholics at all. The criterion of a 24-hour "dry" period was set because the clinic is not equipped to handle the acute emergencies which severe intoxication presents. Rare cases of this type are taken to an emergency hospital. One bed is maintained in the clinic for the occasional patient with convulsions.

Patients are referred to the center from Alcoholics Anonymous and from all psychiatric clinics in the city. Referrals are also made by private physicians, the courts, municipal social agencies, the State bureau of vocational rehabilitation, the city-county hospital, and the county medical society.

Our patients represent a fair cross section of the city's population according to social and economic levels. The majority are skilled and semiskilled laborers and white-collar workers. Women have consistently represented 25 percent of the admissions since the opening day of the clinic.

## Procedures and Services

On arrival, each new patient gives his name and address to the receptionist. The patient is next introduced to the psychiatric social worker. In his own way he describes his problem during an unhurried interview with the social worker—lasting from 45 minutes to an hour. Specific information for statistical evaluation is elicited at the end of the intake interview if the patient has not spontaneously provided the answers during his conversation with the social worker. Before the interview closes, the medical and psychiatric facilities available at the center are discussed with the patient. The social worker attempts to ascertain what type of treatment will be most helpful.

If a new patient manifests no interest whatsoever in group or individual psychotherapy, and if he has had no prior contact with Alcoholics Anonymous, then the functions of Alcoholics Anonymous are explained and a referral may be made to that organization.

The social worker writes a short summary of the intake interview just after seeing the patient. This summary is given immediately to the psychiatrist on duty, who reads it, and then interviews the patient. The drinking problem and the patient's general emotional status are evaluated, and again the various forms of treatment are discussed. On the first day of their contact with the clinic, most new patients are started on medical treatment which consists of adrenocortical hormones and vitamin preparations. Group and individual psychotherapy are discussed, but the first appointment with the therapist—either a psychiatrist or a social worker—is usually deferred for 2 or 3 days in most cases.

Patients are told that if they are interested in either group or individual psychotherapy they should mention their interest to the psychiatrist on duty on their return in the next few days for injections. At that time, an appointment will be made with a psychiatrist or a social worker if individual psychotherapy is requested; if group psychotherapy is desired, the patient's name is listed for one of the group meetings. When an appointment for individual psychotherapy is made with a social worker, the patient is almost always referred to the person who conducted the original intake interview.

The psychiatrist briefly checks the general physical status of the patient, and he may give him a physical examination if it seems indicated. Whenever physical disease is found or is suspected, or if a medical checkup appears necessary, the patient is referred to his family physician or to one of the city or university outpatient clinics.

The Adult Guidance Center believes that a temporary deferment in appointments is often helpful in attempting to elicit motivation for psychotherapy. Our past experience has been that many new patients, particularly patients who are weak and physically rundown from a recent "drunk" or those patients who exhibit the

usual symptoms of hangover, will request medical treatment, individual psychotherapy, and group psychotherapy. Then, in a day or two when they are closer to par, their motivation for psychotherapy would greatly decrease, and they would state that probably the hormones and vitamins would be sufficient.

On January 1, 1952, when the clinic staffing was completed, the policy that all patients be offered either individual or group psychotherapy became effective. In some cases, a patient may receive both individual and group psychotherapy. Prior to that date, only selected cases were offered psychotherapy. Although the budget appropriation provided for full staffing earlier, the acquisition of adequately trained psychiatric social workers and psychiatrists was not completed until then.

Individual psychotherapy is dynamically, that is psychoanalytically, oriented. The patient is given an opportunity to attempt to work through his emotional problems with the help of the psychiatrist or psychiatric social worker. Since all patients at the clinic have a drinking problem, with the possible exception of some of the relatives, the psychotherapy is naturally concerned with this symptom, although no specific attempt is made to limit therapy to this one aspect of psychopathology.

The clinic does extend psychiatric help to the significant member or members of the patient's family when this seems indicated.

Each one of the psychiatric social workers has had considerable experience in psychotherapy. Seldom is there a differentiation between psychiatrist and social worker as to the handling of a particular case. Individual psychotherapy is conducted by the psychiatric social worker under the supervision of the clinic director.

Group psychotherapy is also conducted along dynamic lines with the group leader, a psychiatrist, occasionally giving interpretations, focusing on a particularly significant point in the session, and at times acting as an arbiter. Generally, the group sets the pace. The leader supplies factual information when it will be helpful. The groups are small ranging from 3 to 9 persons and are separated as to sex. Each group meets once a week. The duration

of individual interviews is approximately 50 minutes. Group sessions last approximately 75 minutes.

#### **Followup**

Prior to a major policy change in August 1951, patients were given medication by injection and the frequency of patient appointments was gradually decreased. When a patient had returned physically to par and did not exhibit too much nervousness or tension, he was told that the clinic thought he was doing well and that he had probably achieved the maximum benefit from the injections. He was then asked to return in about a month for a followup interview.

On the basis of experience, this method of followup was not effective. Returns for interviews were few. With the rather sudden discontinuance of clinic contact, many patients resumed drinking. Lacking was the supporting effect of frequent interviews over a long period of time.

Patients are now seen more frequently in the early days of their treatment program, and the decreasing frequency of contact is more gradual. The philosophy of continued contact is discussed with each new patient early in his treatment, and he is told that even though he will eventually be seen only once a month, the clinic would like him to come indefinitely. Definite appointment dates are set. No patient is automatically discharged by the clinic. Patients in individual or group psychotherapy naturally attend more frequently.

In a reasonable period of time the psychiatric social worker attempts to follow by telephone any patient receiving medical treatment only who has missed an appointment. A reasonable period is determined on the basis of frequency of appointments. The tenor of the telephone contact is that the clinic has noticed the patient has missed his appointment—what can be done to help him? This procedure seldom provokes the guilt and hostility generally felt in a situation of being checked on.

It depends on the individual patient in psychotherapy whether a letter followup is used after he has missed one or more appointments. In any case the door is left open and the patient is in no way pressed to return. It is the opinion

of the staff that more active and forceful methods of followup are not directly proportional to a greater number of patients maintaining sobriety or even to longer periods of sobriety in individual cases.

Field followup has never been possible because of the small size of the social service staff. But aside from staff limitations, close followup in the home might not be desirable for the alcoholic patient. Actually, too close surveillance may operate against beneficial results.

### **Educational Activities**

Ever since the inauguration of the clinic, staff members have given talks about the program before Alcoholics Anonymous, the Red Cross, regional groups of psychiatric social workers, and local and State public health meetings. The Adult Guidance Center has participated in panel discussions on psychiatric facilities in San Francisco during National Mental Health Week. Material concerning the clinic's functions has been sent to all social agencies, psychiatric clinics, and other referring organizations.

### **Research and Evaluation**

To evaluate the overall results of treatment for a large group of chronic alcoholics is extremely difficult. Even sobriety, the most objective criterion, must be qualified whenever, it is discussed, since many patients who may have been sober only a few weeks or months during clinic contact have in the past been steady drinkers. With others, even though continued sobriety has not been attained, the conflict in their family relationships has decreased.

A less striking factor, but a meaningful index, is the increase in the number of days patients are spending at work because of less frequent "binges" and shorter recovery periods with clinic treatment.

A most important factor, of course, is the actual existence of a clinic to which sick patients can turn for help. This alone gives immeasurable hope and reassurance to patients and their families and friends.

Since August 1951, when the policy was initiated to have patients keep continued contact

with the clinic, the staff has been able, at any time, to enumerate the active and inactive patients.

As of February 28, 1953, 2,435 patients had been accepted for treatment, and 31,591 visits had been made to the clinic.

From August 20, 1951, through February 28, 1953, 1,573 patients sought treatment; 25 percent of these were women. The 1,573 patients were divided into 4 groups:

<i>Group</i>	<i>Percent</i>
A—Active and "dry"	29
B—Known to have resumed drinking	12
C—Patients with whom clinic has lost contact	51
D—Discontinued clinic treatment for reasons other than drinking	8
Total	100

The clinic gives treatment to a large number of patients. At present, clinic visits average 65 a day. When the 3 criteria of clinic admission are met, treatment is begun almost immediately. No appointments need be made by telephone, and there is very little, if any, waiting for intake interviews. This immediate availability of treatment and the lenient eligibility criteria are undoubtedly important factors in the large percentage in group C. An additional factor is that this figure includes those with only 1 clinic contact. The clinic feels the 29 percent in group A is a reasonable return for the expenditure of funds and hours but naturally hopes to improve this figure. Although it is reasonable to assume that some of the patients in groups C and D are still "dry," adequate followup is not possible for several reasons: small size of the social worker staff, large number of patients, and frequent changes of address. Even though adequate personnel for followup were available, the frequent changes of address would make this activity extremely difficult.

Even the patients in group B, who are known to have had at least 1 slip, attained an average of 66 days sobriety prior to their resumption of drinking.

Since August 20, 1951, 21.1 percent of the patients have participated in either individual or group psychotherapy, or in both: 12.1 percent received at least 1 hour of individual psycho-

therapy in addition to the intake interview; 8.9 percent participated in group psychotherapy; and 0.1 percent participated concurrently in individual and group psychotherapy. The remaining 78.9 percent of the patients have received medical treatment only.

The average number of hours of psychotherapy to date is:

<i>Group</i>	<i>Average hours</i>
A-----	11½
B-----	6
C-----	6¾
D-----	6

Approximately 3 months after the clinic opened, plans were made for a controlled group study to evaluate the benefits achieved with adrenocortical hormone and vitamin therapy. Although laboratory facilities are not available for any extensive pharmacological deter-

minations, the effect of the drugs on various physical and emotional symptoms and the duration of sobriety can and are being evaluated.

The comparative effectiveness of medical treatment with or without group or individual psychotherapy is in the process of assessment, although it is often difficult, if not impossible, to state specifically the factors leading to a patient's improvement. The clinic is interested in the comparative speed of recovery from acute alcoholic symptoms with the use of adrenocortical hormones and various vitamin preparations. The results of group and individual psychotherapy can be evaluated in terms of the individual development of healthier and more adequate personality defenses leading to more mature, realistic behavior. In most cases this realistic behavior leads to the state and maintenance of sobriety.

### **Gamma Globulin for Poliomyelitis Is Distributed**

Initial supplies of gamma globulin for use against paralytic poliomyelitis were released by the Office of Defense Mobilization and shipped to State and Territorial health officers by the Public Health Service in mid-May.

Under policies established by the Office of Defense Mobilization, about 57 percent of the total national supply of immune serum globulin available for poliomyelitis inoculations is being distributed. An additional 33 percent is for use in mass prophylaxis where epidemics are most severe. The remainder, about 10 percent, will be assigned for research and emergency purposes. Concerning the allocation plan, the Office of Defense Mobilization notes "it is expected that further modification and supplementation will be necessary from time to time in the light of experience and existing circumstances."

The first release of the agent was not sufficient to provide State health departments with their complete basic allocations. Subsequent shipments are being made automatically, without further request from health officers, until distribution of the entire basic allocation has been accomplished.

# Evaluation of Sanitation Programs in a City-County Health Department

By J. A. SALVATO, Jr., M.C.E.

Objective evaluation of the environmental sanitation programs conducted by State and local health departments serves many purposes. It can provide the basis for integrating, adjusting, and balancing the programs. It can be used to demonstrate the need for obtaining and retaining competent personnel. It aids the administrator of the programs in determining whether available personnel are being utilized to do the work considered most important. It can provide facts for supporting program recommendations and policy determinations.

To be of value, evaluation studies should consider workload, work done, quality of the work, and its effectiveness. The data assembled must, of course, be reliable, and they must be interpreted in the light of thoroughness and competence of the inspections.

Continual evaluation of environmental sanitation programs has been carried on in the Erie County (N. Y.) Health Department for the past 4 years. It has proved to be effective in showing which programs need more inspection time, which are receiving too much inspection time, and which are not producing results.

## Uniformity of Inspection

It must be recognized that inspections can be made with varying degrees of completeness, depending upon such factors as amount and kind

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of supervision, training and experience of personnel, policies and customs of the health department, and inspection procedures. Inspection work and accomplishments can be summarized and the various environmental sanitation programs compared, however, only if all inspections are conducted with the same degree of thoroughness. Therefore, a basic requirement for evaluation studies is the establishment of uniform quality inspection based upon accepted public health principles. This necessitates the development and proper use of satisfactory compliance guides, including inspection forms or checklists, for each activity inspected and the provision of continuing in-service training for inspectors and supervisors.

The inspection-compliance forms prepared by the Michigan Department of Health in cooperation with the Kellogg Foundation; the "Recommended Guide for Satisfactory Operation of Camps" developed by the Poughkeepsie district office of the New York State Department of Health, the Public Health Service's recommended "Ordinance and Code Regulating Eating and Drinking Establishments" and its recommended "Milk Ordinance and Code," and "A Proposed Housing Ordinance," prepared by the American Public Health Association Committee on the Hygiene of Housing incorporate useful compliance guides. Manuals and guides, of course, are not a substitute for intelligent and mature judgment, but they are indispensable administrative aids which, with constant supervision, will help maintain uniform quality enforcement of a sanitary code.

**Figure 1. Sample tabulations from the statistical summary form used for recording inspection data in the Erie County Health Department.**

Activity	Fourth quarter	Total, 1952
1. Multiple dwellings—3 or more families:		
a. Number of places on record.....	7,083	7,083
b. Number inspected of total on record—original for year.....	319	3,180
c. Number of inspections made.....	2,284	9,391
d. Number of places with deficiencies.....	316	1,653
e. Number of places eliminating all deficiencies.....	350	1,079
2. Camps—recreational, trailer, tourist:		
a. Number of places on record.....	129	129
b. Number inspected of total on record—original for year.....	10	129
c. Number of inspections made.....	93	715
d. Number of places with deficiencies.....	19	106
e. Number of places eliminating all deficiencies.....	2	83
f. Number of permits issued.....	9	98

### Workload and Work Done

In analyzing the work of a department, inspection data should be organized so that the status of every activity under supervision is readily given. For this purpose, the Erie County Health Department developed a special statistical summary form. At first completed monthly, this form is now completed quarterly. It shows not only the work accomplished during the reporting period but also a cumulative total for the year.

Two examples of the tabulations on the statistical summary form are shown in figure 1. Breakdowns similar to these may be used for all activities under routine supervision—rooming houses and hotels, nursing homes, public places, schools, swimming pools, pasteurizing plants, dairy farms, slaughter houses, restaurants, public water supplies, and so forth. A modification of these breakdowns is needed for special program activities, such as rodent control, nuisance inspections, stream pollution studies, private water supply and sewage disposal inspections, legal actions, and plan reviews.

The sum of the "Number of places on record" (fig. 1, a) for each activity is the workload of the bureau in connection with places for which it has routine responsibility. The total workload is determined by adding to this figure

the number of special program services provided.

The "Number inspected of total on record—original for year" (fig. 1, b) indicates what part of the work has been done and what part remains to be done if each place is to receive an annual inspection. This information is very valuable in planning future work. For example, the multiple dwelling tabulation shows that less than half the structures on record were inspected by the end of the year. If all structures are to be visited annually, more emphasis will have to be placed on the inspection of this activity.

The "Number of inspections made" (fig. 1, c) tells where inspection time is being spent and the average number of inspections each place has received. This information may indicate a need for redirecting inspection time or for greater field supervision. It must of course be considered in relation to the results produced. In the camp tabulation for example, all places were inspected during the year about  $5\frac{1}{2}$  times. This figure might be considered high, but the high percentage of places eliminating deficiencies tends to confirm that the time was well spent.

A need for redirecting inspection time, however, was found at the end of 1949 when the rec-

ord of the number of inspections made in each activity revealed that 75 percent of the general sanitation time in Buffalo was being spent investigating complaints, work which is not usually productive of lasting improvements. Inspection of multiple dwellings on a planned program basis was not possible under these circumstances. By deliberate redirection of inspection time toward multiple dwellings, it was possible over a 3-year period to inspect every multiple dwelling on a planned followup basis for the first time in the history of the city. In 1952, only about 45 percent of the housing inspector's time was spent investigating complaints, and this percentage may be reduced further when a modern minimum standards housing code recommended by the health department is adopted.

The "Number of places with deficiencies" (fig. 1, d) and the "Number of places eliminating all deficiencies" (fig. 1, e) show the progress being made and the condition of the places under supervision. If a place removes all deficiencies and on subsequent inspection is found to have slipped back, it would again be listed as a place with deficiencies. When progress is unsatisfactory, additional inspection, supervision, or review of the program may be indicated. The key may be a lack of direct supervision, poor quality of supervision, departmental policy, lack of promotional opportunities, or poor morale. Interpretation or definition of deficiencies, of course, may vary with the individual, unless adequate inservice training is given and satisfactory compliance guides are developed and used.

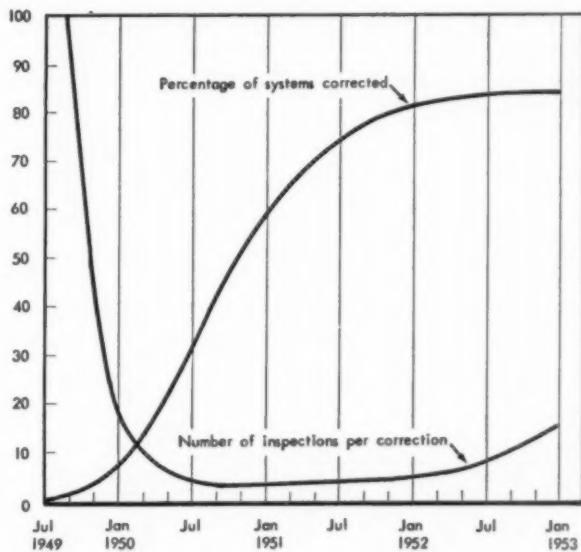
When places with deficiencies removed are compared with the number of inspections, an indication is obtained of the number of inspections per place corrected. The point of diminishing returns can thus be seen (fig. 2).

The "Number of permits issued" (fig. 1, f) shows those places under supervision which on inspection were found in compliance with the existing regulations, assuming that annual permits are issued only after report of satisfactory compliance is received.

#### Frequency of Inspection

The amount of time spent in making original inspections can be expected to vary widely from

**Figure 2. Percentage of individual systems corrected and number of inspections per correction in a community sewerage survey, Erie County, N. Y., 1949-53.**



the "average," dependent upon the size of the establishment, problems, missionary work done, and so forth. An original inspection requires a complete inspection report and letter confirming recommendations.

Reinspection calls for reviewing previous correspondence and corrections made, completing an inspection checklist summarizing some 25 to 50 specific items, answering identification questions, listing specific deficiencies, noting steps taken in the field to correct the deficiencies, and writing practical recommendations for correcting specific deficiencies. Major deficiencies and recommendations for corrections are confirmed in writing to the responsible person by administrative personnel. With experience and proper training the inspector can do much of the paper work, with resultant increased efficiency and accuracy of reporting.

The conditions found at the time of the last inspection should determine the time and frequency of reinspection. For some activities, an average of 3 inspections per year is needed to maintain a satisfactory operating level of sanitation. Other activities, such as rooming houses, may require only 2 inspections per year after the third or fourth year of continuous supervision, whereas private sewage

disposal systems may require 6 or 8 inspections per correction or per installation.

### Inspection Supervision

Review of inspection reports by trained, experienced, and competent sanitary engineers or sanitarians directly responsible for specific activities will aid in evaluating the field work from day to day. Incomplete reports, a high percentage of "no violations," sketchy explanation of the deficiencies observed, and no recommendations, or vague and nonspecific ones, readily become apparent. An unusually large or small number of inspections made in a day may indicate whether or not an inspector is trying to do a good job.

The ratio of supervising engineers or sanitarians to inspectors will depend upon such factors as the difficulty of the work, its newness, and the degree of progress already made in obtaining satisfactory compliance. In a going housing or restaurant program, the ratio may be 1 supervisor to 6 or 8 inspectors; in a farm labor camp or recreation camp inspection program, it may be 1 to 4; a special housing appraisal or stream pollution survey may require a ratio of 1 to 2. Since environmental sanitation activities are of a wide range of difficulty, broad generalizations are usually incorrect.

### Production

Information useful in the planning and management of an operating program may be obtained from the inspection data assembled on the statistical summary form, as follows:

$$\text{Average number of inspections per man-day} = \frac{\text{Number of inspections}}{\text{Number of man-days}}$$

$$\text{Average number of hours per inspection} = \frac{\text{Number of productive hours per day}}{\text{Number of inspections per man-day}}$$

The number of inspections is given on the statistical summary form. The number of man-days can be determined from payroll and attendance records; and the number of productive hours per day, by subtracting hours spent in office routine from the total working hours.

An example will illustrate the procedures for these determinations. During 1952, approxi-

mately 25,000 inspections were made in the cities of Buffalo and Lackawanna and 10,000 in the remainder of suburban and rural Erie County, not including inspections of public water supplies, sewage treatment plants, food, and food-selling places. There were 5,067 man-days on duty in the cities and 2,777 in the remainder of the county. The net average annual work year was 241 days. Analysis of a typical day showed the following "nonproductive" work: 1 hour in writing reports, discussing special problems, making appointments, receiving inservice training, and so forth;  $\frac{1}{2}$  hour in getting to the first assignment, and  $\frac{1}{2}$  hour in maintaining good public relations; therefore, of a 7-hour workday (exclusive of the lunch hour), 5 hours were spent in "productive" work. Thus:

$$\text{Average number of inspections per man-day (cities)} = \frac{25,000}{5,067} = 4.9$$

$$\text{Average number of inspections per man-day (county)} = \frac{10,000}{2,777} = 3.6$$

$$\text{Average number of hours per inspection (cities)} = \frac{5}{4.9} = 1.02$$

$$\text{Average number of hours per inspection (county)} = \frac{5}{3.6} = 1.39$$

These figures, which may be determined for a total program or for one activity, have many uses. Annual comparison of this information on an overall and activity basis will indicate trends and may show where special attention is needed. The figures also can be used to determine the approximate number of personnel needed to carry out existing inspection responsibilities or new program activities; an adjustment must be made, of course, if the activity is of more or less than "average" difficulty. For example, an analysis of a general sanitation bureau showed that it had an annual workload of 17,685 places, and that 11,271 of them were inspected during the year a total of 35,145 times. Each place was therefore inspected an average of 3.1 times. The places not inspected (17,685 - 11,271) amounted to 6,414. If an average of 3.1 inspections is required for reasonable control, 19,883 ( $6,414 \times 3.1$ ) additional inspections would be needed. Since this work is in the city of Buffalo, where experience has shown that 4.9 inspections can be made per man-day, 4,058 additional man-days

$(19,883 \div 4.9)$  or 17 men  $(4,058 \div 241)$  would be needed, in addition to supplementary supervisory staff. Of the 6,414 places not inspected, however, 2,164, or one-third, represent barber and beauty shops, the inspection of which is being deemphasized. Hence the number of men needed might be reduced by one-third.

### Efficiency

The inspection data may also be used in evaluating the efficiency of the sanitation bureau or of a particular program. It is first necessary to have determined by an impartial expert the amount of time that should be required to make each type of inspection. Multiplying the number of inspections actually made by the time required for each type will give the total time that should have been spent to do the work reported. The ratio of the time required to the time actually spent will give the percentage efficiency. It is not inconceivable that an efficiency of 200 or 300 percent may be found where quantity rather than quality has been emphasized.

The following calculations illustrate the procedure for determining the percentage efficiency.

The amounts of time required to make inspections in three activities, adjusted to allow for travel time, were determined separately by an impartial expert, and the total number of hours theoretically required to make the inspections reported in these activities was calculated as shown in the table. The actual time spent in making 25,000 inspections in Buffalo during 1952 was 5,067 man-days, as previously determined. Thus, the actual time spent in making the 19,640 inspections in these three activities, which represented 93 percent of the total, was 4,720 man-days. Since the number of productive hours per day was 5, the total number of hours spent in the field was 23,600  $(4,720 \times 5)$ . The efficiency of the inspection work in Buffalo in 1952 was therefore 83 percent  $(19,640 \div 23,600)$ .

In 1951, the efficiency of the inspection work in Buffalo was 76 percent; in 1950, approximately 87 percent; and in 1949, approximately 140 to 200 percent. During 1949, the first year

### Theoretical time required to make inspections reported in 3 activities, Buffalo, 1952

Activity	Number of inspections made	Time required per inspection <sup>1</sup>		Total time required (hours)
		Minutes	Hours	
Rooming houses:				
Original inspection	1,359	65	1.08	1,470
Reinspection	1,644	50	.83	1,365
Multiple dwellings:				
Original inspection	3,180	65	1.08	3,440
Reinspection	6,122	50	.83	5,090
Complaint investigation	11,021	45	.75	8,275
Total	23,326			19,640

<sup>1</sup> Determined by an impartial expert.

of actual operation of the city-county health department, inspections were not based upon any uniform inspection report form or checklist. During 1950 and 1951, reorganization, inservice-training, full-time operation of the Public Health Service-New York State-Erie County sanitary inspectors training school and the development of uniform inspectional procedures received first priority. These efficiency figures show the changing emphasis from quantity to quality inspection. Such figures must, of course, be interpreted with caution, as figures in themselves may be valueless.

### Summary

The development of satisfactory compliance guides and inspection report forms and the provision of inservice training and adequate, competent program supervision are essential for inspection data to be significant. Environmental sanitation programs and activities in different health departments can be compared only if the quality of the work, accomplishments, and supervision are on the same level. Analyses mentioned here are subject to different interpretations dependent upon local conditions. The evaluations are valuable administrative guides which, when properly used, will serve the administrator well.

## World Health Organization

# The National Conference On World Health

A selective report of discussions in Washington, April 6-8, 1953, sponsored by the National Citizens Committee for the World Health Organization

FROM April 6 through 8, 1953, a National Conference on World Health met in Washington. Its participants primarily were representatives of civic and professional organizations—more than 100 groups sent accredited delegates—called together by the National Citizens Committee for the World Health Organization.

The chairman of the committee's steering group—Frank G. Boudreau, M.D., of the Milbank Memorial Fund—remarked at the conference that "doctors and other public health workers know that health is not something you can hand over to people, like food or money. Health—personal, national, or international—must be worked for, it must be wooed and won. Therefore, it stands to reason that health above all other subjects, needs the understanding and support of the peoples of every country."

It was this line of thought, Dr. Boudreau noted, that prompted WHO to suggest organizing national citizens committees for the World Health Organization. Similar committees now exist in Austria, Canada, and Finland. The United States group grew out of separate explorations by the National Health Council and the American Association for the United Nations. The steering committee,

nucleus of the present National Citizens Committee for the World Health Organization, was authorized by the National Health Council in January of 1951. Now an independent organization, the National Citizens Committee states its purpose is "to acquaint our people with the relationship of public health to the general welfare and peace in all parts of the world community, and to increase appreciation of the importance of international health programs."

The chief responsibility of the Washington conference of April 1953, Dr. Boudreau said, is "to help the steering committee work out the role which the National Citizens Committee should play, and to make recommendations concerning its methods, program content, and the channels through which it should operate."

The real labor of the conference took place in 6 working parties or seminar groups, supplemented by reports and observations by leaders in international health affairs. In advance of publication of full proceedings by the National Citizens Committee, *Public Health Reports* presents a report of the operations of the World Health Organization, illustrations of WHO/UNICEF cooperative projects, and short quotations from three talks.

# The Nature of the World Health Organization

By HENRY VAN ZILE HYDE, M.D.

**O**N AUGUST 18, 1796, Harman Blennerhassett, writing from New Utrecht, Long Island, New York, to a friend in England, told the following tale:

"Some time last summer, a Yankee, at a little town in the State of Massachusetts, learning the times were mortally sickly at Port au Prince, conceived a scheme of sending there a cargo of—coffins. Those commodities were made up in nests of sizes, from the largest to those for infants and, that no room should be lost, the inner coffins of the nest were packed with cakes of—gingerbread. I have only to add, that the speculation turned out a capital hit—our Yankee having actually returned full freighted with the best West Indies produce, in return for his timber."

On March 17, 1953, 157 years later, a dispatch originating in Port au Prince appeared in the New York Times under the headline: "U. N. and U. S. Help Haiti Fight Yaws—Antibiotic Injections Rapidly Wiping Out Disease Once Infecting 1,000,000."

This dispatch tells the dramatic story of an international cooperative effort to eradicate a disease which is holding back the growth and development of a neighboring nation. It tells of cooperation which involves a number of agen-

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*Dr. Hyde, now chief of the Public Health Service's Division of International Health, formerly was head of the health staffs of the Technical Cooperation Administration and the Institute of Inter-American Affairs. He has served since 1948 as the United States member of the WHO executive board.*

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cies and governments—cooperation carried on under the inspired and inspiring leadership of the World Health Organization.

Between Blennerhassett's letter of 1796 and the New York Times story of 1953 lies not only the discovery of the causes of infectious disease and their methods of control but also an awakening to the fact that prosperity for all lies in health rather than in disease: in life, rather than in death.

Today, the world reaches out with a helping hand, not with coffins but with trained personnel and with scientific, practical knowledge and skills for the promotion of human health. This is the great purpose of the World Health Organization.

## Organization of WHO

The organizational structure of the WHO follows, in general, the simple pattern characteristic of the other specialized agencies.

A World Health Assembly composed of representatives of all the member states meets annually as the governing body of the World Health Organization. It determines the policies, votes the budget, and assesses the members.

An executive board composed of 18 technically qualified persons designated by 18 governments chosen by the Assembly meets twice annually to review the Director-General's budget proposals and to delve into the many matters of policy, administration, and relationships referred to it by the Assembly.

A secretariat, appointed and lead by the Director-General, carries on the day-to-day work of the Organization.

A feature unique in the United Nations structure is the regional organization of WHO.

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"Learning and knowledge are to be gained from our mistakes as well as from our victories. It is to be hoped that from the work that is being done throughout the world in international health it may be possible for some of the less developed countries to avoid some of the mistakes of the more developed countries. Some short cuts may be made, and a great deal of grief can be avoided by learning from mistakes.

"It is important that we all recognize that no group, no culture, no people, has yet found the perfect way of living—not even of providing medical care. There is something to learn from all patterns and there is something to be discarded from all patterns about which we know anything at the present time. There is much to be learned from the attitudes of the so-called underdeveloped countries. Many of them have developed wisdoms that we have hardly ever had or have forgotten. I think no person has worked in international health—and particularly those who have worked in close contact with the people of the underdeveloped countries—who has not gained greatly in terms of his own experience and stature and value of his own community. . . .

"The people of the underdeveloped countries are

very tolerant people, generally. They are willing to absorb the peculiarities of those who come to help them, and some of our customs are very peculiar indeed, from their points of view. It is so easy for us to take for granted that our ways are or should be standard and that if everyone would just do things the way we do them everybody would live happily ever after; there would be no conflicts and everything would be fine. Of course, this is not true. In our own groups and in our own cultures, we also have troubles. We have not yet found all the answers and it would be a very bold person indeed who would go into any underdeveloped country and say: 'You should do as we do and then you will have no more troubles.' Yet occasionally this is the attitude that is taken towards some of the underdeveloped countries. When that does happen the people of those countries are very polite. In effect they say, 'Oh yeah,' and let it go at that. They are far more polite, generally, than we are. They are far more willing to accept our peculiarities than we are to accept theirs, and they even try to understand our limitations and make allowances for us."

—Brock Chisholm, M. D.  
Director-General, WHO, 1948-53

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The World Health Assembly has divided the world into six regions in order to decentralize operations and, to a degree, policy development. In each of these regions there is a regional office and a regional committee. The regional office is headed by a director, appointed by the executive board on the nomination of the regional committee. The regional director reports to the Director-General. The regional committee is composed of the governments of the region. It meets annually to review regional problems and needs and proposed plans and budgets. Program development and budget construction begin at the regional level and finally take form in the Assembly.

Through its decentralization, WHO is brought nearer to the people and to the governments it serves, being more responsive to their needs.

## Functions

The World Health Organization exists in order to render service, first, to the world at large and, second, to its individual members—the governments of which it is composed.

## Services to the World

There are certain services that must be performed on a world basis if they are to have significance. These services are not new with the World Health Organization. They have grown up during the past half century as the world has become an increasingly more intimate place. They had their origins in the International Office of Public Health, which was founded in 1907, in the Pan American Sanitary Bureau, and in the League of Nations.

Daily from Singapore, throughout the vast reaches of the Pacific, and from Geneva, and over a network reaching Africa, Europe, and the Americas—WHO broadcasts reports on pestilential disease as a guide to shipping and an aid to quarantine officials. In the East, where cholera, plague and smallpox remain a daily concern, this is a service of first importance. We can hope to see an end of this business in our time. But it is not yet. Unnecessary diseases, including the easily preventable scourges of the Dark Ages, are still the daily companions of vast numbers of our fellow men. That fact must weigh heavily on our own consciences, so long as it remains a fact. Meanwhile, WHO must perform those services which limit such diseases and keep them within bounds.

Certain agents important in medicine and public health are used universally. These include antitoxins, serums, vaccines, antibiotics, vitamins, and insecticides. World War I showed the need for the development of international standards in regard to such products. While tetanus antitoxin manufactured in the United States and that manufactured in France were equally effective, they were differently measured and marked because there was no internationally agreed unit of measurement. As a result, soldiers died horribly and unnecessarily, because of errors in dosage. Today within WHO the world has a system of standardization, serving all people everywhere. In the research laboratory in Bethesda, Md., at the bedside in Rangoon, in the jungle field station on the Congo—scientists, medical officers, and native vaccinators speak the same language. In utilizing WHO standards, they understand one another, immediately and distinctly.

WHO serves as the world clearinghouse in the many fields of knowledge which, taken together, constitute "public health." Through panels of experts drawn from the world at large, it keeps itself abreast of knowledge. On occasion, committees of experts, drawn from these panels are brought together to resolve special problems or advise on current issues. Reports of these committees are basic documents in health throughout the world. There are some 50 such reports now dealing with the control of particular diseases such as tuberculosis, schistosomiasis, and malaria; with training and administration;

with broad problems such as environmental sanitation and nursing. The world looks to WHO to keep it reliably informed and up to date.

### Services to Members

A new thing in our generation—an area of great hope and promise—is the service that WHO is rendering to its members in the management of their own health problems and in the development of their own health services. It is here that we can see a new future for the billions of mankind. We see, in the distance, man living as man should—clean, healthy, and productive; free and at peace.

There are three elements to this aspect of the WHO work—advice, demonstration, and training.

1. *Advice.* The WHO is prepared to send advisers on any phase of public health to governments seeking such assistance. Such advisory service may relate to the organization and administration of public health on a national basis. An international team sent to Israel, for instance, reviewed the national health service at the request of the Government and made important, far-reaching recommendations. Advisory services may also be highly specialized, as when advisers are sent to Chile in connection with the production of diphtheria and whooping-cough vaccine to be used in a nationwide campaign. Advisers are drawn from the permanent central or regional secretariats or, perhaps more often, on a short-term basis from national and local health services, public and private laboratories, universities and foundations in all parts of the world.

2. *Demonstration.* Carrying advice into the field of practical action, WHO, on the request of governments, conducts demonstrations of modern public health methods. Four WHO demonstrations of malaria control, conducted in widely separated parts of India, created the understanding and popular demand that has led to a nationwide project now being launched with a view to the mass control of malaria in India during the next 3 to 5 years.

In India today there are an estimated 100 million cases of malaria each year. Its control would release some 3 billion man-days of pro-

ductive effort and lift an incalculable burden of human suffering. Last spring I visited the Terai, the great plains at the base of the Himalayas. I was shown a modern 16,000-acre farm which 2 years previously had been a tiger forest. Only through malaria control had it been possible to open up this fertile area which had been unproductive through the centuries. This was an example of what can be done and is being done in many areas of the world. A WHO demonstration team was at work in the Terai and can be credited with giving new life to an area of great potential.

It has been my privilege to visit many countries in which WHO is at work. I have seen its malaria demonstration teams in the foothills of the Himalayas; its tuberculosis teams in Delhi, Karachi, Baghdad, and El Salvador; its maternal and child health teams in Columbia, Egypt, and Najafghar, India. Even a cursory glance through the Director-General's annual report gives a sense of great accomplishment over wide areas of the world. Vital and vigorous projects are under way. It is, indeed, heartening to find the influence of the World Health Organization reaching so deeply into the far parts of the earth. Demonstration teams are planting seeds of knowledge that are growing among the peoples of the world, that are seen and understood in their deep significance by the governments.

3. *Training.* While demonstrating ways and means of attaining progress in health, WHO is assisting in building up a corps of trained men and women, everywhere, to do the job that must be done. During its short career, WHO has awarded 2,608 fellowships for foreign study to physicians, nurses, sanitary engineers, and other technicians. This group, with the thousands trained under the auspices of private foundations and various government programs, are the world health leaders of the future.

To a large extent, WHO owes its own existence to the leadership of men and women who, a generation ago, had similar opportunities for foreign study under the Rockefeller Foundation program.

The WHO training program is not limited to fellowships alone. Teaching missions, regional seminars, visiting lecturers, and other

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"I am told and I have observed personally in many countries, that mothers and fathers in the less developed countries love their children dearly. These people dislike illness and suffer pain as much as we do. In the Near and Far East you will see many blind and near blind people on the streets; people with sore eyes, living skeletons engaged in hard work, many, many hopeless cripples. So the survivors of the perils of infancy look forward to lives of sickness and pain, brought to a premature close long before they have lived out the normal span of life. . . . We must face the question as to whether in similar circumstances, we would not be apt to embrace any doctrine no matter how evil, if it gave us hope of relief from sickness, pain, and premature death. One thing we can do, and the quicker we do it the better, is to help the people of the less fortunate countries to clear away the mass diseases, for there can be no economic development, no rise in the standard of living, until this barrier has been removed. We must then go on to help them to develop their material and human resources, and in both of these things the World Health Organization is best fitted of all UN agencies to lead the way."

—Frank G. Boudreau, M.D.

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available devices are utilized to build the strength of teaching institutions around the world.

### Coordination

The World Health Organization is not working alone. Rather, it is the coordinating force in a complicated structure of many agencies. Under its constitution it is the "coordinating and directing authority in international health work."

There are a number of agencies concerned with various aspects of world health: United Nations International Children's Emergency Fund; United Nations Educational, Scientific, and Cultural Organization (UNESCO); the Food and Agricultural Organization (FAO); the Technical Cooperation Administration (TCA); the Mutual Security Administration (MSA); the Colombo Plan; private agencies

and foundations, industry, churches, and others. Each has its special motivation, its special drives, its own resources, its special values.

It is not strange that the world should be a complicated environment. Certainly a local community is a complicated affair with its several departments of local government, its PTA's, Rotary Club, women's clubs, church groups, chamber of commerce ad infinitum. A concept that the world should be simpler than the town is not a valid one. The job of the World Health Organization is not, as some have proposed, to stand alone and do the whole job of international health. Rather, its job is to mobilize the great forces that are available; to give the lead to us all.

It is doing this. It is increasingly setting the sights for all agencies, pointing up opportunities for social and economic advancement through health improvement. It has brought about jointness of operation in the place of what could have been duplication and waste. Examples of its coordinating activity are found in joint committees with FAO, ILO (International Labor Organization), and UNICEF, and in the holding of coordinating conferences among the operating staffs of the various agencies in the field of health. Such conferences have been held at the country level. They are held regularly in certain regions and have been held at the world level in Geneva.

In February 1953, for instance, a joint staff conference of the TCA health staff in Africa and Asia and the WHO headquarters and regional staffs was held in Geneva. It has led to a depth of understanding and intimacy of relationship which could be attained in no other way.

In health it is fair to say that under the leadership of the World Health Organization the various national and international programs have become, in a very real sense, a single, unified movement with a common goal and common methods of attaining that goal.

During 1952, 12,600 villages, one-third of all the villages in Iran, in which are the homes of some 4 million Iranians, were treated with DDT. The report of the United States Director of Technical Cooperation—the Point IV

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"Nations must work together for their common good against their common enemies—violence, poverty, ignorance and disease. We can't take them on one at a time because they are all tied together, and we can't act alone because we're all tied together. The late Justice Holmes said that continuity with the past is not a duty. It is only a necessity. I would say the same of international cooperation. It is not a duty. It is only a necessity."

—Ambassador James J. Wadsworth,  
Deputy United States Representative to the  
United Nations

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program—which contributed substantial sums to this campaign, includes the following statement:

"This campaign against malaria in Iran is a truly international effort. Iran's Ministry of Health, Institute of Malariaology of the University of Tehran School of Medical Sciences, the World Health Organization's Malaria Control Advisory Team consisting of a malarialogist, an entomologist and a sanitary engineer, and Point IV have all joined in this program in Iran. Cooperation and coordination has been excellent considering the great area of Iran, poor communications and usually bad roads, and other organizational problems of an undertaking as great as this program. The WHO team are 'tops' and to them must go much of the credit for the technological success."

Indeed, international cooperation is a living reality. In the World Health Organization, there is represented something new and fine which has come into the world since the Yankee trader took his profits from "mortally sickly" Haiti. We, as United States citizens, can take a great measure of satisfaction in this change to which we, as a nation and a people, have contributed so much of goods and spirit. We can take pride in America's part in building WHO. We can explain this to our fellow citizens so that they too may find satisfaction in a job well done and worth pushing ever forward.

# Two Cooperative Projects of WHO and UNICEF

By S. M. KEENEY

**I**N ASIA, the World Health Organization and the United Nations International Children's Emergency Fund (UNICEF) work hand in hand on 50 projects in 15 countries in which UNICEF has invested \$20,000,000 in supplies and WHO is supplying 100 professional personnel. These projects range from training projects, in which the main investment is for personnel, to mass campaigns where the foreign technical personnel may be only 5 percent of the project.

Our approach is to keep in mind always that the projects are not those of UNICEF or WHO. We are working together to help governments. It is even more important to remember that both our agencies and the government are merely the means of getting a job done for the people. The people, in fact, must be an essential fourth partner for, unless their cooperation is active, in the long run we shall fail.

UNICEF administratively is a small organization in Asia. We have only about one international staff member for every million dollars. We have one regional office, in Bangkok, Thailand, which covers the projects in the Western Pacific and Southeast Asia WHO regions, together with Pakistan, which falls into the Eastern Mediterranean region of WHO. The reason UNICEF has only one regional office is that it is feasible and much cheaper to handle supply problems for the entire area; WHO must deploy professional people and cannot work over so large an area. Examples will illustrate the cooperation which exists between WHO and UNICEF.

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*Mr. Keeney is director for the Southeast Asia region—with headquarters at Bangkok—of the United Nations International Children's Emergency Fund.*

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## Yaws in Indonesia

A yaws project in Indonesia began about 3 years ago and has treated to date about 700,000 cases found among some 7 million people. The job is only 10 percent done, for there are at least 7 million cases in the islands among the 75 million population.

UNICEF has made a first allocation of \$1,200,000 and has just voted an additional \$450,000 which will be enough to carry the project at least through 1955. The Government has paid all the local expenses and, beginning this year, will pay for one-third of the penicillin to be used for adults.

## Joint Job from the Start

To start the project 3 years ago, WHO sent a specialist to consult with the Government and to make preliminary recommendations. Dr. Thomas Parran of the University of Pittsburgh Graduate School of Public Health confirmed this need in a general study of urgent needs in Asia. Several of us from UNICEF went in to work out the administrative details. From the beginning, it was thus a cooperative job. A full-time foreign clinical specialist and a serologist were maintained for 2 years. The rest of the work has been done by the Indonesians themselves, and in the last year the only international WHO member has been the serologist. This does not mean, however, that the project does not have technical supervision. A statistician was necessary last year for some months to examine the records and to make suggestions for improving them. He did a most acceptable job and is asked to return this year.

The first 2 years' work proved that, even with the very few dollars, it was possible to organize

teams of male nurses who could do a thoroughly acceptable job cleaning out yaws, village by village. The trouble was that there was not even enough nurses. It was therefore determined to bring into the plan eventually all of the polyclinics, of which there are some 1,200 scattered over Indonesia, and to use the male attendant to do the injections under the supervision of the regency physician. Something more was needed, however—someone to find the cases in the villages and bring them together for treatment. This person has only a high school education and perhaps only 3 months' training, but he is carefully picked so that he is acceptable to the village, and he works through the village headman.

This plan was tested under the guidance of Dr. M. Soetopo, a member of the WHO Expert Committee and a leading venereologist in Surabaja. Careful preliminary tests were made to find out whether the system would work at all, how effective it would be, how fast the work could be done, and what the cost would be. The tests were simple, but carefully done, because on that the whole expansion depended.

### Bangkok Yaws Conference

Here again WHO came into the picture. These tests were carefully examined in the first International Yaws Conference held in Bangkok March 1952, with 60 specialists in attendance from most countries that have yaws. There was much discussion of the conditions that must be put on work that has to be done with so little medical supervision.

The conference was not satisfied to discuss the papers brought from Indonesia. A special committee of three made a special study on the spot of the methods that were being used. They suggested a number of technical changes that ought to be made, but, in general, gave their hearty approval to the plan and urged that it be expanded to treat at least a million cases a year.

We are now in the midst of that expansion. The whole job is being done by the Indonesians themselves. There is on the spot, however, as country representative from WHO, the previous regional specialist on yaws who regularly consults with the national team leader. In fact,

the team leader, the WHO representative and the UNICEF mission chief work together to develop a sound and feasible administrative plan.

It is still too early to determine the results. The plan is beginning, however, on schedule; almost 100 local units have already been started; and by the end of 1953 the goal is 300. The rate of treatments per month is expected to rise from about 25,000 to at least 50,000 by the end of this year, and to at least 75,000 a month next year. We are still far from the goal, but we are on the way.

### BCG Work in India

Largely because of the amount of transport needed, the UNICEF investment in this project is relatively high. The work of the professional staff, however, has been more important in BCG work than in yaws, because the secret of success is, even more than in yaws, that of rapid and effective organization: to assemble millions of children quickly and get the highest percentage of them back to have their tests read.

The beginnings of this work in India and in Asia in general were discouraging. There was considerable opposition, and much educational work needed to be done. Greater obstacles were poverty, the lack of roads, the heat, and the monsoon. It has been found, however, that careful preparatory work does make possible the organization of successful campaigns under every condition except that of civil war, which occasionally holds up matters temporarily.

Against these discouraging beginnings is the record of recent accomplishment in a new type of campaign in Delhi State. The goal was 700,000 children to be tested within a month. All the local health forces available were marshaled, and several teams were brought in from neighboring States. This was partly to recognize good work done in their local States and, as a bonus, to give them a chance to see the capital.

### Tests and Vaccinations

Fortunately, the weather was good and the children relatively easy to gather. The most effective method, long since worked out, was

to provide a little music, and all the school bands in town were marshaled. Where a band wasn't available, an energetic drummer with a double-headed drum was quite adequate to get the crowd together. Public address speakers, mounted on jeeps, patrolled the area telling the people that the test was of no use unless they came back to have it read and to be vaccinated, if necessary.

When the campaign was closed on March 21, 1953, the goal had been passed, and the number actually tested was 751,000. The percentage of return was 67, which is almost the average for a slower campaign. One team of 11 persons had tested 16,500 children in a single day. This means, of course, that the team itself did only the actual test; the rest of the community brought the children and took them away.

The number of children expected to be tested under this program in India in April 1953 will be more than a million, and in all the area rather more than one and a half million persons. Our goal for the year is 16 million, and we think we will pass it. We are, however, desperately in need of a few more physicians, for several wholly new programs await only a team leader without whom the program cannot start.

### **It Can Be Done—Together**

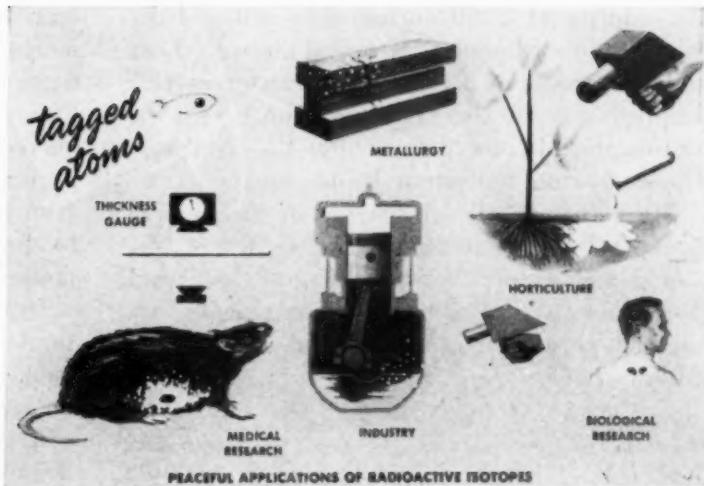
Three years ago we were about ready to say that mass programs among the villages of Asia were not feasible. We know now that, even

with the tiny budgets available, they are quite possible if we face the local conditions realistically. To do a successful job, we must have a strong national leader in charge, a few good international personnel specially trained and with rugged constitutions. Given this, and enough transport and a steady supply of vaccine, the job can be done. It is above all things, however, a team job. The government cannot do it without help from outside. WHO cannot do it without money for equipment and supplies from UNICEF. UNICEF certainly cannot do it without WHO-trained personnel.

In the struggle to get money for our budgets, the separate agencies of the United Nations are tempted to talk only of themselves in order to catch the ears, against all the competing din of other claimants, of the people who vote the money. This may be necessary at times, but it ought not to be the pattern. Professional advice is not enough; supplies alone are not enough; but when competent technical advice and imported supplies are offered together, then things begin to happen. And it is only when things begin to happen in the countries receiving the aid that they begin to understand that the United Nations means business. The endless headlines emphasizing international quarrels do not sell the United Nations to Asia. They are likely to say: "A plague on both your houses!" If we want to impress them, it will be with deeds—not words.



## *Radiation Exposure in the United States*



# Reactor-Produced Radioactive Isotopes

By **SAMUEL C. INGRAHAM, II, M.D., M. P.H., JAMES G. TERRILL, Jr., C.E., M.B.,**  
**and DADE W. MOELLER, M.S.**

RADIOACTIVE ISOTOPES "in the types and quantities producible in a nuclear reactor create health and safety problems which are not necessarily limited to the individual user, but are a matter of public interest as well." This statement was made by the United States Atomic Energy Commission (1), which is responsible for distributing and supervising the use of all reactor-produced radioactive isotopes in this country. It demonstrates the need for continual vigilance relative to these materials.

Although the radiation exposure received by persons using radioactive isotopes appears to be of a relatively low level, it is a fact that their use is becoming more widespread. Today more than 1,100 medical institutions, colleges and

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universities, industrial firms, Federal and State laboratories, foundations, institutes, and physicians have used or are using these materials. About 7,500 persons are directly involved in their use, besides the persons who are receiving medical applications of radioactive isotopes.

Reviewed here are data from the literature on the amount of radioactive isotopes in use, regulations concerning shipment and use, and levels of radiation exposure received by persons involved. These data supplement an earlier presentation by the authors on the principal sources of radiation exposure in the United States (2).

### **Distribution**

The Isotopes Division of the United States Atomic Energy Commission distributed only 96 curies of radioactive isotopes in fiscal 1947, the first year distributions were made. Each year since that date, the amount shipped has increased substantially. A total of 4,250 curies had been distributed by June 30, 1952. Of this amount, almost 1,800 curies were radioiodine and radiophosphorus, which decay rapidly.

An additional 2,200 curies were radiocobalt, which is distributed as a sealed source. Less than 1 percent of all the radioactive material shipped was in the very hazardous class of radiomaterials, as defined by the National Committee on Radiation Protection.

More than 31,000 shipments of radioactive isotopes were made from the Oak Ridge National Laboratory between August 1946 and November 1952. The number of shipments during this period for each principal isotope is as follows (3) :

<i>Radioactive isotope</i>	<i>Number of shipments</i>
Iodine-131	12,058
Phosphorus-32	8,784
Carbon-14	1,381
Sodium-24	1,218
Sulfur-35	680
Gold-198, -199	963
Calcium-45	468
Iron-55, -59	415
Cobalt-60	634
Potassium-42	506
Strontium-89, -90	234
Other	4,033
Total	31,374

The following data show the distribution of radioactive isotopes from August 1946 through June 1951 according to use (1) :

<i>Field of utilization</i>	<i>Number of shipments</i>
Medical therapy	8,981
Animal physiology	4,328
Physics	1,274
Chemistry	1,040
Plant physiology	877
Industrial research	784
Bacteriology	321
Other	1,300
Total	18,905

### Transportation

The Interstate Commerce Commission is empowered to formulate rules and regulations to assure the safe interstate transportation of radioactive materials by commercial motor vehicle, rail, and water carrier. They cooperate in the formulation of regulations with the American Association of Railroads, the United States Coast Guard, and the Civil Aeronautics Board, which act as the enforcement agencies in their respective fields. Regulations governing postal shipment of radioactive materials are both formulated and enforced by the United States Post Office Department and are adminis-

tratively independent of the Interstate Commerce Commission. However, the Post Office must collate their regulations with those of the Commission since several carriers may be involved in any one shipment process. These regulations attempt to protect people and films from exposure to radiation and at the same time to limit the cost and burden of shielding materials (4).

Interstate Commerce Commission regulations limit the quantity of radioactive substance packed in 1 outside container to 2 curies, except by special arrangement. They limit the allowable radiation from the shipping container to 200 milliroentgens per hour at the surface and 10 milliroentgens per hour at a distance of 1 meter. Both of these requirements must be satisfied. Shipments are exempt from these regulations if they contain 0.1 millicurie or less of radioactive material and meet other special requirements that overcome the radiation hazard. The Atomic Energy Commission has reported approximately 95 percent of all shipments have had an external radiation level of less than 0.015 roentgen per hour at the surface of the container.

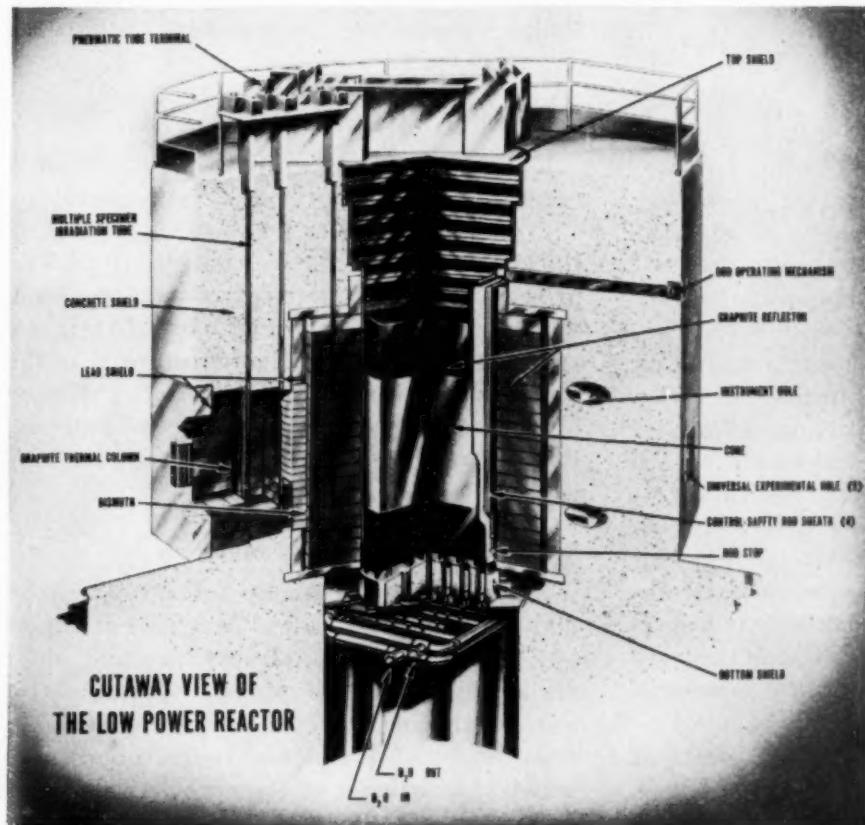
The contractor at the Atomic Energy Commission installation assumes responsibility for packaging isotopes, in accordance with the regulations. Generally, the only concern is transporting the material to the user from the installation. However, the recent trend for the prime receiver of radioactive isotopes, such as a large central hospital, to process and redistribute them to secondary receivers, such as smaller hospitals, creates additional transportation problems.

### Control of Utilization

The Atomic Energy Commission, exercising its responsibility under the Atomic Energy Act of 1946 (Public Law 585, 79th Cong. 2d sess.), has to date accomplished control of radioactive isotope distribution and use by an allocation or "licensing" procedure. The radioactive materials distributed by the Commission have been made available only to those who have the necessary prerequisites in training and equipment to handle the materials safely (1). A secondary receiver is, of course, subject to the



## Production of Artificial Radioactive Isotopes in a Low Power Atomic Reactor



The top sketch shows the reactor housing, control stations, and other equipment as they would appear in use by industry, universities, and other research institutions. At left is a cutaway drawing of the reactor. This "atomic furnace" can be operated at a rate of 8 hours a day, 5 days a week, for 10 years before being recharged. It was designed for the Atomic Energy Commission. (Illustrations courtesy of North American Aviation, Inc.)

same regulations in the handling and usage of the radioisotopes as is the primary receiver.

The allocation control procedure is complemented by the activities of an advisory field service. Radiological safety specialists visit users and offer advice on the design of radiochemical laboratories, remote handling equipment, and shielding, decontamination procedures, standardization of measurements, and the safe use and disposal of radioactive isotopes. The practices, equipment, and records of the users are reviewed with particular emphasis on factors involved in radiation safety (5).

According to the Atomic Energy Commission, increased use of radioactive isotopes in the future will necessitate supplementation of the present centralized method of control by supervision at the point of use. The responsibility of the Commission for the control of the hazards from "byproduct materials," as described in the Atomic Energy Act of 1946, is being supplemented by a joint Atomic Energy Commission-Public Health Service program of assisting state and local health organizations to assume responsibility for the day-to-day surveillance of Commission-distributed radioactive isotopes.

#### Exposures to Radiation

In handling and preparing radioactive isotopes, the user and the personnel nearby are potentially exposed to internal and external radiation. When radioactive isotopes are used for medical diagnosis and therapy, the patient too receives exposure. It should be emphasized, however, that the exposure received by the patient in the medical application of radioactive isotopes is a planned exposure and is administered for his net medical benefit.

The most persistent hazard to health associated with the use of these materials is the possibility of internal radiation as the result of radioactive substances being accidentally ingested, inhaled, or absorbed. The enormous potency of very small amounts within the body is emphasized by the recommended standards (6), which are summarized in table 1.

Since the determination of the amount of radioactive material within a person's body is, at present, a complicated procedure, few data

Table 1. Maximum permissible levels for specific radioactive isotopes

Radioactive isotopes	In the body (micro-curie)	In liquid media (micro-curie per ml.)	In air (micro-curie per ml.)
Iodine-131	0.3	$3 \times 10^{-5}$	$3 \times 10^{-9}$
Phosphorus-32	10	$2 \times 10^{-4}$	$1 \times 10^{-7}$
Carbon-14	{ 250 (fat) 1,500 (bone)	$3 \times 10^{-3}$ $4 \times 10^{-3}$	$1 \times 10^{-6}$ $5 \times 10^{-7}$
Sodium-24	15	$8 \times 10^{-3}$	$2 \times 10^{-6}$
Cobalt-60	3	$2 \times 10^{-3}$	$1 \times 10^{-8}$
Strontrium-89	2	$7 \times 10^{-5}$	$2 \times 10^{-8}$
Strontium-90 (+ Yttrium-90)	1	$8 \times 10^{-7}$	$2 \times 10^{-10}$

are available regarding exposures due to internal radiation. Data on external radiation exposures have, however, been reported. One report concerns the weekly exposures, as measured by film badges, of 140 persons working in radioisotopes laboratories. Of 4,750 film badges worn by these persons during an 8-month period, only 1 indicated a weekly exposure greater than 0.3 roentgen, the maximum permissible weekly dose. More than 4,700 badges indicated weekly exposures of less than 0.05 roentgen (7).

#### Radioactive Isotopes in Industry

Radioactive isotopes are being used in a variety of research problems, in radiography, and in such testing and measuring devices as thickness and liquid level gauges (2). The principal radioisotopes used in industry, some of their properties, and examples of their use are listed in table 2. The figures given in the third column illustrate the enormous potency of small quantities of the radioactive isotopes; they are not necessarily related to the quantities actually used in the examples cited.

#### Radioactive Isotopes in Medicine

Radioactive isotopes are used both internally and externally for medical diagnosis and therapy. In this report, intracavitary and interstitial uses of sealed sources of radioactive isotopes are considered external since the radioactive material does not leave the container in which it is sealed even though it is within the body. Some of the better known medical ap-

plications of radioactive isotopes are as follows (8):

**Sodium-24**—Correlation of sodium turnover with congestive heart failure; differentiation of normal and restricted blood flow; radioangiography (determining pumping qualities of the heart).

**Phosphorus-32**—Determination of extent of tumor mass in brain tumor surgery; treatment of polycythemia vera and chronic leukemia.

**Iodine-131 in diiodofluorescein**—Location of certain brain tumors.

**Iodine-131**—Detection of hyperthyroidism; location of thyroid cancer offshoots, or metastases; treatment of hyperthyroidism, thyroid cancer, and metastases.

**Cobalt-60**—Interstitial sources for treating accessible tumors and teletherapy units for deep-seated tumors.

**Strontium-90**—Beta-ray source for treating surface lesions.

**Gold-198 (colloidal)**—Treatment of subsurface tumors of lymphoid system and chronic leukemia.

#### *Internal Sources*

Iodine-131 is the most widely used radioactive isotope for medical purposes, and phosphorus-32 ranks second. A medium-sized hospital (150 to 300 beds) participating in the isotopes program will have some 35 millicuries of radioactive iodine on hand. A large hospital (400 to 700 beds) may have 200 to 300 millicuries of this material, according to the January 1951 report of the Joint Fire and Ma-

rine Insurance Committee on Radiation of the major private underwriting and insurance associations.

Radioiodine given orally is rapidly absorbed from the gastrointestinal tract and distributed throughout the body. In normal persons, the thyroid gland will fix 10 to 25 percent of the dose and the remainder will be excreted in the urine within 24 hours. In patients with hyperthyroidism, 50 to 80 percent of the dose may be fixed by the thyroid (9).

Radiophosphorus is given either orally or intravenously. About 75 percent of the oral dose is absorbed and the remainder is lost in the feces. Of the amount reaching the circulatory system, whether the dose is administered orally or intravenously, 20 to 40 percent is excreted quickly through the kidneys, and the rest is distributed throughout the body (9).

Thus, in the medical application of radioactive isotopes the whole body is subjected to some radiation, most of which occurs during the first day or so after the dose is given. For example, for each millicurie of radioactive phosphorus administered to a patient, the resultant total-body irradiation is 10 roentgen equivalents physical, taking into account the half life of the isotope and the excretion of part of the dose (9).

Table 3 presents the range of the usual doses of iodine-131 and phosphorus-32 and the theoretical exposure resulting in the critical organ of the body. Calculations were made from published data, as indicated.

**Table 2. Radioactive isotopes in industry**

Radioactive isotope	Half life	Millicuries of radioactive isotope per gram of total element as available	Example of use
Cobalt-60	5.3 years	34 to 5,000	
Selenium-75	127 days	3.3 to 100	
Tantalum-182	117 days	105 to 1,500	
Carbon-14	5,720 years	250 to 1,500	
Strontium-90	25 years	<sup>1</sup> 160,000	
Barium-140	12.8 days	<sup>1</sup> 72,000,000	
Antimony-124	60 days	12 to 1,500	
Iron-59	46.3 days	500 to 1,500	
Calcium-45	152 days	0.2 to <sup>1</sup> 19,000,000	
Yttrium-90	2.54 days	115	
Lanthanum-140	40 hours	525	
}			
Radiography.			
}			
Thickness gauge.			
}			
Mark interfaces and measure intermixing in pipelines.			
}			
Measure engine wear.			
Evaluate detergents.			
Used as tracer in dyeing process.			
Determine sulfuric acid content in chromium plating solutions.			

<sup>1</sup> Approximate.

**Table 3. Range of radiation exposures from diagnostic and therapeutic doses of radioactive phosphorus and iodine**

Radioactive isotope	Disease	Average total oral dose <sup>1</sup> (microcuries)		Selected critical organ	Total radiation exposure to selected critical organ <sup>2</sup> (roentgens or roentgen equivalents physical)	
		Diagnosis	Therapy		Diagnosis	Therapy
Iodine-131.	Hyperthyroidism.	100 to 300 (usually 100).	3,000 to 10,000.	Thyroid <sup>3</sup>	<sup>4</sup> 100 to 1,100.	<sup>4</sup> 11,000 to 40,000.
	Thyroid cancer.	1,000 to 3,000.	<sup>5</sup> 50,000 to 250,000.		<sup>4</sup> 4,000 to 11,000.	<sup>4</sup> 24,000 to 300,000.
Phosphorus-32.	Blood dyscrasias.	100 to 500.	3,000 to 10,000.	Bone. <sup>7</sup>	2 to 7.	40 to 130.
				Muscle.	1 to 3.	20 to 65.

<sup>1</sup> Source: Medical physics, edited by Otto Glasser. Chicago, the Year Book Publishers, Inc., 1950, vol. II.

<sup>2</sup> Sources: Marinelli, L. D., Quimby, E. H., and Hine, G. J.: Dosage determination with radioactive isotopes. II. Practical considerations in therapy and protection. Am. J. Roentgenol. 59: 260-280 (1948).

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isotopes in biology and medicine. Madison, University of Wisconsin Press, 1948, p. 377-394.

See also footnote 1.

<sup>3</sup> Average thyroid weight of 30 grams used in calculations.

<sup>4</sup> Assumes 75 percent absorption of oral dose in thyroid.

<sup>5</sup> Usually consists of a series of smaller doses.

<sup>6</sup> Assumes 10 to 30 percent absorption of oral dose in thyroid.

<sup>7</sup> Weight of bones in average man assumed to be 7,000 grams.

Periodic radiation surveys of the areas in the hospital where these patients are located may be required, and the wearing of film badges by the nurses caring for them is recommended (12). The external radiation hazard may be minimized through use of the protective measures—distance, time, and shielding.

The patient who has been given one or more doses of a radioactive isotope requires special supervision and handling if nurses and other personnel are not to become contaminated. It is recommended that rubber gloves be worn while bathing the patient (12). In addition, such problems as the contamination of bed linen must be considered. These articles may require special storage or laundering procedures (10).

#### External Sources

Strontium-90 and cobalt-60 are the principal radioactive isotopes used in medical therapy as external sources of radiation. Beta-ray applicators (strontium-90) are available for the treatment of certain eye conditions. Cobalt-60

As can be seen from these data, exceptions to the standards established for permissible levels of radiation are made when radioactive isotopes are used clinically since the intent here is to produce or measure biological changes rather than to avoid them. In certain therapeutic applications of radioactive isotopes, the total-body irradiation may be 75 to 100 roentgens.

Powell (10) reports that patients who have received internal applications of radioactive materials do not ordinarily constitute a significant source of external radiation. However, when a therapeutic dose of a gamma-emitting isotope, such as iodine-131, has been given, the maximum permissible dose level, 0.3 roentgen in air per week or 7.5 milliroentgens per hour for a 40-hour week, may be found as far away as several feet from the patient. It has been recommended as a public health precaution that "patients who receive large doses of iodine-131 or gold-198 should be hospitalized until the total residual activity in the body is not over 30 millicuries" (11).

is available in the form of large shielded concentrated sources for deep therapy and in the form of small needle sources for intracavitary and interstitial therapy. The Atomic Energy Commission has authorized 12 applicants to use teletherapy units, amounting to a total of some 16,000 curies. Three of these units are already in operation. Twenty-two applicants have been authorized to use small sources, such as needles, totaling some 7,600 millicuries.

Dosages administered to the patient are of the order of 6,000 to 7,000 roentgens. Such therapy, however, is used only for conditions demanding drastic measures, and the exposure is limited to a small section of the patient's body.

### Wastes

Wastes from the use of radioactive isotopes by industry, the medical profession, and research laboratories could create health hazards to persons outside the installations using them. However, if the recommendations for the disposal of the wastes from the use of phosphorus-32 and iodine-131 made by the Subcommittee on Waste Disposal and Decontamination, National Committee on Radiation Protection (13), are followed, few, if any, hazards should arise. Ruchhoft and Feitelberg (14) have shown that the dilution needed to reduce the activity of liquid isotopic wastes from hospitals to safe limits is generally available, and, therefore, their disposal is not a major problem. Radioactive isotopes, such as cobalt-60, which are distributed as sealed sources normally have no waste disposal problems.

### Conclusion

It would appear that the radiation exposure in the United States due to reactor-produced radioactive isotopes distributed by the Atomic Energy Commission is currently limited to relatively few people and is of a relatively low level. However, there is no indication of a decline in the use of these materials, but rather there is a strong probability that their use will become much more extensive. Further study of radiation exposure from this source as data become available may be required.

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# Anthrax in the United States

By JAMES H. STEELE, D.V.M., M.P.H., and RAYMOND J. HELVIG, D.V.M., M.P.H.

**A**NTHRAX TODAY does not seem to present the serious public health problem of former years. In 1951, only 60 cases were reported to the National Office of Vital Statistics, Public Health Service. Forty-five, or 75 percent, of these cases occurred in the northeastern States and were attributed to occupational exposure. There were less than 15 human cases in other States. The highest incidence occurred in January, February, March, April, May, and November. During the period 1945 to 1951, inclusive, 372 cases of human anthrax occurred, most of them in the 7 northeastern States, where industrial exposure is usually stated to be the source of infection (table 1). In the remaining 41 States, 63 cases were reported, of which 29 (21 farmers and 8 veterinarians) were due to agricultural exposure. Twenty States reported no cases of anthrax in the period 1945-51; 24 reported less than 10 cases; 1, less than 25; 2, less than 100; and 1, more than 100.

The 5 cases reported in Florida were attributed to an outbreak of bovine anthrax in the fall of 1951. The individuals involved were a cowboy who skinned a cow, dead of anthrax, two veterinarians who vaccinated cattle in this area, a laboratory technician who handled a suspected specimen, and a child in a nearby town. In Arkansas 5 of 9 cases were associated with the skinning of a cow that had died suddenly. The farmer was assisted by his family and neighbors in the salvage operation. The 2 cases

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reported in Kentucky were in farmers who removed the hides from mules that had died of anthrax. The mule carcasses then were fed to swine, and the swine developed anthrax. In California, one of the cases occurred in a sheep-herder who sheared infected sheep. On different occasions, three California veterinarians contracted the disease while performing post mortems on a cow, dead of anthrax. In New Jersey, a farmer who killed and dressed an infected heifer developed the disease. Most of the human cases reported in the western and southern States occurred under similar conditions. All of the cases were of the cutaneous type. There are no records of human anthrax caused by the ingestion of contaminated milk or meat in the United States in recent years.

During 1952 provisional reports indicated that there were 42 human cases of anthrax in the United States. This compares with 60 in 1951. Three of the 1952 cases occurred in Ohio: in a veterinarian, a laboratory technician who handled specimens, and a carpenter who worked in a feed mill where contaminated feed had been handled.

## Animal Anthrax

During the period 1945 to 1950, inclusive, 658 outbreaks of animal anthrax were reported from 32 States with estimated losses of 8,504 head of livestock. Occurrences in new areas were reported from 51 counties in 16 States. In 1951, a noticeable increase in outbreaks was observed. There were 483 outbreaks in 25 States involving 113 counties, with a loss of 2,753 animals. Three-fourths as many outbreaks occurred in 1951 as in the 6-year period 1945-50; however, the total number of animal losses was

Table 1. Reported cases of human anthrax: United States and each State, 1945-51

Area and State	1951	1950	1949	1948	1947	1946	1945	Total
United States	60	49	54	60	69	40	40	372
New England:								
Maine					1			1
New Hampshire						2	7	9
Vermont								
Massachusetts	5	4	3	3	2	2	4	23
Rhode Island								
Connecticut	1	1		1		1	1	5
Middle Atlantic:								
New York	5	3	26	13	25	10	3	85
New Jersey	8	7	2	16	9	4	2	48
Pennsylvania	26	25	13	18	18	15	11	126
East North Central:								
Ohio			1			1	1	3
Indiana								1
Illinois			1					
Michigan								
Wisconsin								
West North Central:								
Minnesota								
Iowa								
Missouri	1							1
North Dakota					1			1
South Dakota								1
Nebraska						2		2
Kansas			1					1
South Atlantic:								
Delaware	1	2		1				4
Maryland		1						1
District of Columbia								
Virginia								
West Virginia								
North Carolina								
South Carolina								
Georgia			1				1	2
Florida	5							5
East South Central:								
Kentucky	1			1				2
Tennessee								
Alabama								
Mississippi								
West South Central:								
Arkansas	1	1			7			9
Louisiana				2			2	4
Oklahoma					1		2	3
Texas		1			2	2	2	7
Mountain:								
Montana								
Idaho						1	2	3
Wyoming								
Colorado		2						2
New Mexico			3	1				4
Arizona				1				1
Utah								
Nevada								
Pacific:								
Washington					1	1		2
Oregon								
California	6	1	4	1	3		1	16

less than in 1946 when there was a severe epizootic in Louisiana which killed over 3,000 animals. Missouri had the highest losses in 1951, with 694 animal deaths, of which 440 were in horses and mules. Fairly large losses were re-

ported in California, Florida, Illinois, Iowa, Kentucky, Nevada, Tennessee, and Texas.

An unusual feature in the 1951 losses was the great number of widely scattered outbreaks in swine. The Bureau of Animal Industry, U. S.

Department of Agriculture, reported 1,088 swine deaths compared to 1,001 deaths in cattle. The greatest swine losses were in Illinois, Iowa, Missouri, and Kentucky. Coincident with the increased number of swine cases was the condemnation of 232 infected carcasses by the Federal Meat Inspection Service. These 232 cases were more than half the total of 367 hogs and 39 cattle condemned because of anthrax during the entire period July 1945 through December 1951 in establishments under the supervision of the inspection service.

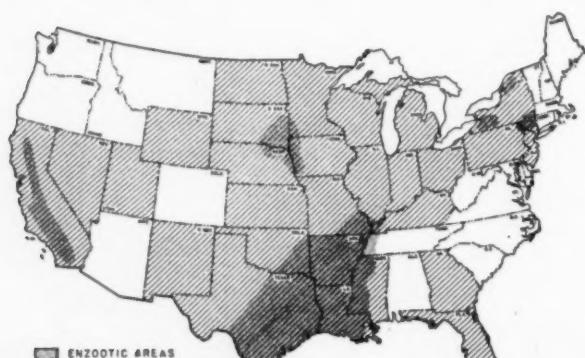
In 1951, outbreaks in animals were reported in 15 States, in 51 counties which previously had had no history of the disease: Indiana, Kentucky, Mississippi, New Jersey, and Ohio, 1 each; Florida, Minnesota, and Oklahoma, 2 each; Louisiana, Tennessee, and Wisconsin, 3 each; Missouri, 4; Texas, 6; Illinois, 10; and Iowa, 11. No human cases were attributed to any of the swine outbreaks. Wisconsin also reported 102 cases in mink. These were thought to have been caused by ingestion of infected animal feed.

The Florida outbreak was the first since 1928. The disease involved deer, and beef and dairy cattle. The cause was not determined. Bone-meal was suspected, but laboratory examination did not reveal *Bacillus anthracis*.

Although swine are considered to be more resistant to anthrax than any other livestock species, the disease is not uncommon in these animals in the areas where the infection exists enzootically. Infections in swine have also oc-

curred in noninfected areas because of consumption of contaminated feed, but cases usually appear after infection of other livestock. Infection in swine usually results from their feeding on carcasses of animals dead of anthrax, from following infected animals, or from deep rooting in contaminated pastures during warm weather. Anthrax in swine may take many forms including the acute or the chronic forms with characteristic symptoms of septicemia or glossitis with enlargement of the cervical lymph nodes. In addition, mild or latent cases often occur which are not readily diagnosed. The swine outbreaks that occurred in the midwest in 1951 were all on premises hitherto considered free from infection and far removed from enzootic areas. Although the Bureau of Animal Industry, in cooperation with State livestock sanitary authorities, carried on special investigations, they failed to establish a definite source of infection. The history of some cases suggested that contaminated mixed feed may have been the source of infection. Laboratory examination of suspected feed samples failed to reveal *B. anthracis*.

The map illustrates the prevalence of anthrax in cattle, swine, horses, sheep, and mink in 1952. The stippled areas are the known enzootic areas. These areas were not involved in the swine outbreaks. Twenty States did not report any animal anthrax. The largest number of cases was reported in swine in the midwestern States (table 2) during the winter and early spring. This unusual seasonal occurrence is of special significance, inasmuch as anthrax is usually considered a warm weather disease among animals. Ohio had outbreaks in 56 counties involving over 280 farms. Indiana reported cases in 46 counties on 106 farms. Illinois reported 50 counties and 117 farms with anthrax cases. Michigan had 17 counties and 31 farms with infection. Wisconsin reported anthrax in 17 counties on 35 farms. All of these States reported the isolation of *B. anthracis* from bone-meal and attributed most of their outbreaks to contaminated bonemeal. It is important to observe that none of these States is considered to be an anthrax enzootic area. Previous to the outbreaks of late 1951 and early 1952, anthrax had not been reported in Indiana and Ohio for more than 20 years. Illinois and Wisconsin



**Anthrax in cattle, swine, horses, sheep, and mink.**

Source: Bureau of Animal Industry, U. S. Department of Agriculture, and Public Health Service.

Table 2. Anthrax outbreaks, 1951-52

State	Date of reported outbreak	Counties involved	Farms involved	Cases in—					Bonemeal isolation
				Humans	Sheep	Cattle <sup>1</sup>	Swine <sup>1</sup>	Miscellaneous	
<b>1951</b>									
Illinois-----	August-----	50	117	1	2	25	672	1 dog	Yes.
Florida-----	October-----	1	17	5	-----	200	9	2 horses	No.
Oklahoma-----	November-----	11	-----	1	-----	63	-----	-----	No.
<b>1952</b>									
New Jersey-----	January-----	5	20	2	-----	22	12	-----	No.
New York-----	January-----	6	16	1	-----	-----	-----	mink <sup>2</sup>	No.
Texas-----	January-----	62	160	-----	10	400	10	-----	No.
Kansas-----	February-----	4	100	-----	50	85	-----	-----	No.
Ohio-----	February-----	56	280	2	-----	10	500	-----	Yes.
California-----	March-----	2	2	-----	-----	-----	-----	-----	Yes.
Indiana-----	March-----	46	106	-----	-----	4	100	-----	Yes.
Iowa-----	March-----	17	28	-----	-----	-----	-----	-----	Yes.
Michigan-----	March-----	17	31	-----	4	19	15	-----	Yes.
South Dakota-----	March-----	1	1	-----	-----	-----	-----	-----	Yes.
Missouri-----	April-----	3	4	-----	-----	10	-----	-----	Yes.
Wisconsin-----	April-----	17	35	-----	2	22	3	mink <sup>2</sup>	Yes.
New Mexico-----	May-----	1	1	-----	-----	-----	-----	-----	No.
Georgia-----	June-----	2	4	-----	-----	2	4	-----	No.
New Jersey-----	June-----	7	13	1	-----	28	-----	mink <sup>2</sup>	No.
Total-----	-----	308	935	13	68	890	1,325	3	-----

<sup>1</sup> Estimated.<sup>2</sup> Number of cases unknown.

had not had any cases for years, and Michigan had not had a case since 1916. Dr. H. J. Stafseth, Michigan State College, states in a personal communication that the 1916 case is the only known diagnosed case up to 1952. The outbreaks in Ohio, Indiana, and Illinois mainly involved swine, while those in Wisconsin and Michigan were mainly on dairy farms. Wisconsin also had additional cases in mink, as did New Jersey and New York.

Kansas reported bovine anthrax in February. In April, anthrax was reported in beef and dairy cattle on more than 100 farms. An investigation revealed that anthrax had occurred only in herds that had been vaccinated with bacterin. The incubation period was from 3 to 120 days.

In 1952, Georgia reported the first outbreak of anthrax in animals since prior to 1945. Bonemeal was suspected as the vehicle of infection but this was not proved.

Florida had a reoccurrence of anthrax in the summer of 1952 in the area where the 1951 outbreak was reported, and the 1952 outbreak

spread to noninfected areas. Anthrax following vaccination with a bacterin was also reported. Of 300 beef cattle vaccinated by a rancher, 15 developed symptoms of anthrax 4 to 8 weeks following inoculation; 7 died, 2 of them after the surviving affected animals were treated with 3 million units of penicillin daily. None of the 15 animals exhibited typical symptoms and at first the cattle were thought to have been bitten by a snake. An extensive swelling was noted around the site of inoculation behind the shoulder, which in some cases extended forward to the brisket and back to the udder. The course of disease extended over a number of days.

The Ohio swine outbreaks which began in February 1952 were studied by the Ohio Division of Animal Industry and the Ohio Department of Health. These investigations were the first to reveal that imported raw bonemeal was contaminated with *B. anthracis*. Illinois, Michigan, Indiana, Wisconsin, and Missouri reported isolation of anthrax spores from bonemeal samples. The bonemeal was traced to a

New York importer who had bought it in Belgium. Further investigation revealed that the bonemeal had been collected in Asia and southern Europe and brought to Belgium for reshipment to the United States and subsequent distribution in the midwest.

It is interesting to observe that nearly all the hogs involved were pregnant or nursing sows. This is readily explained by the fact that they were the only animals receiving a high protein-calcium ration which is recommended for the pregnant or nursing animal. Few or no cases were observed among other animals, except where some of the sow supplement ration was fed to other animals by mistake, or where through their own efforts, the animals were able to reach it.

The U. S. Department of Agriculture has adopted regulations prohibiting the importation of raw bonemeal. All bonemeal entering this country must now be sterilized at a temperature of 250° F. under 20 pounds of pressure. In addition, many States have adopted similar regulations.

One of the important observations made in the Ohio outbreak was that penicillin or other antibiotics are to be preferred to immunizing agents in the control of anthrax in swine. The administration of 6 million units of penicillin in oil proved very effective in the large sows which weighed from 200 to 400 pounds or more. Penicillin has been used successfully in the treatment of cattle also but is not recommended as a control measure in place of vaccination. In

some bovine cases there have been relapses following the injection of penicillin. Aureomycin and terramycin were used with success.

#### Public Health

Even though anthrax is not readily transmitted to man, the numerous outbreaks of the disease in animals during the past 2 years have raised a number of public health questions. These questions include: What measures should be taken in handling milk from infected premises? How should meat animals from known infected farms be processed? What steps can be taken to prevent occupational disease among animal handlers? What procedures are recommended for animal disease control so as to remove any threat to public health?

#### Milk

The question of what to do with milk from a farm where anthrax has occurred in a milking herd or in other animals cannot be answered in all cases by a decision to quarantine the premises, but requires an examination of the problem at hand. As previously stated, there are no reports in the United States of the transmission of anthrax in milk to man. The results of unduly stringent quarantine regulations may tend to discourage reporting of anthrax, and such procedures may also present a serious economic problem to the dairyman. Some sizable nuisance problems have been known to develop when the milk from 500 or 600 cows was dumped on a farm in a warm climate.

The following recommendations have been formulated by the Public Health Service, with the assistance of the Bureau of Animal Industry of the U. S. Department of Agriculture, the Federal Food and Drug Administration, the Federal Civil Defense Administration, U. S. Livestock Sanitary Association, and the American Veterinary Medical Association.

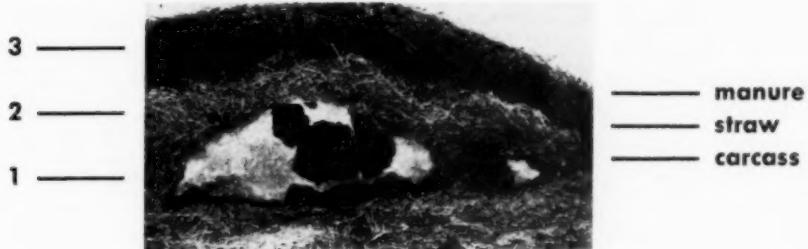
The recommendations, which appear on pages 621 and 622, were transmitted February 4, 1953, by the Public Health Service to State and Territorial milk control authorities and others concerned. In forwarding these recommendations, Dr. Otis L. Anderson, chief of the Bureau of State Services, said:

"In the preparation of this material we have



**A cow dead of anthrax. Note the great number of flies on the carcass. Virulent anthrax germs were found in flies taken from this and a partly incinerated carcass on the same ranch.**

### One method of disposing of an anthrax-infected carcass by incineration



1. Saturate carcass with kerosene, crank case oil, or any other inflammable oil.
2. Cover carcass with a hayrack-full of straw.
3. Place two loads of heavy manure on top of the straw. Set afire. Add manure daily, or when necessary, to keep carcass covered until it is burned to a white ash.

attempted to be objective, realizing that: (a) there are no supported records in the literature of anthrax being transmitted to man through the consumption of milk; (b) unduly stringent quarantining measures may tend to discourage

reporting of anthrax thus nullifying control procedures; and (c) quarantining of dairy farms and exclusion of the entire milk supply from the market when a case occurs, may present a serious economic problem for the dairyman."

### Anthrax Control Recommendations

**1.** All cases of anthrax, or suspected anthrax, should be reported by the dairyman to the local veterinarian and the health officer immediately, and such animals should be isolated completely from the herd and no milk from them sold until declared by a licensed veterinarian to be free from anthrax.

**2.** Where anthrax has occurred in the dairy herd and the animal or animals affected were stabled in the dairy barn:

a. All feed, hay, straw, manure and dirt likely to have been contaminated, the carcass of each animal dead from anthrax, and milk suspected of containing anthrax organisms or spores, should be disposed of promptly by complete burning or by deep (at least 6 feet) burial, under the direction or supervision of the State health department and/or the State livestock sanitary officials; the dust should be removed from the walls and ceilings; and the entire barn, including walls, ceilings, windows, floors, feed troughs, brooms, shovels, forks, spreaders, etc., should be thoroughly cleaned by washing with a 5-percent lye solution which should be left in contact with surfaces for at least 8 hours.

b. The temperatures of the remaining animals in the milking herd should be taken, immediately

prior to each milking, by a veterinarian or some other official person designated by the health officer to take such temperatures, for a period of 10 days following the removal or recovery of the last case of anthrax. The records of such temperatures should be available at all times for examination by the health officer, livestock sanitary officials, and others concerned. All animals having a temperature of 103° F. (cattle in hot, humid climates often have body temperatures of 103° F. without having any infection; in this case a recheck of the temperature in the late evening or early morning, would be indicated) or showing any other evidence of disease should be isolated from the milking herd immediately, and no milk from such animal should be mixed with the market milk supply until such suspects are declared by a licensed veterinarian to show no further evidence of disease.

c. The milk utensils which have been exposed to any secretion or excretion from the anthrax infected animal should be submerged in boiling water for a period of at least 30 minutes as soon as possible after contamination. This should be done under the supervision of the State or local health department, or the State livestock sanitary officials.

**3.** Where anthrax has occurred in any animal which has been in the same pasture or lot with the dairy cattle:

a. The entire herd should be removed from such lot, pasture, or portion of pasture, which is likely to have been contaminated by the infected animal, for such time as the State livestock sanitary authority deems necessary.

b. The temperatures of all of the cattle in the milking herd should be taken, immediately prior to each milking, by a veterinarian, or some other official person designated by the health officer to take such temperatures, for a period of 10 days following the removal or recovery of the last case of anthrax. The records of such temperatures should be available at all times for examination by the health officer and others concerned. All animals having a temperature of over 103° F. or showing any other evidence of disease, should be isolated from the milking herd immediately, and no milk from such animal mixed with the market milk supply until such suspects are declared by a licensed veterinarian to show no further evidence of disease.

**4.** Where anthrax has occurred in any animal on the dairy farm, but has been completely separated from the dairy herd; or where anthrax has occurred on adjoining farms:

a. The dairy herd should be kept under close observation for a period of at least 10 days and any evidence of anthrax reported immediately to the health officer and the local veterinarian.

**5.** Where dairy cattle are vaccinated for anthrax:

a. Such preventive vaccination should be done in a manner and with a product which is approved by the State livestock sanitary authority.

b. The temperatures of all animals vaccinated against anthrax should be taken, immediately prior to each milking, by a veterinarian or some other official person designated by the health officer to take such temperatures, for a period of 10 days following vaccination or presence of anthrax infection on the premises. The records of such temperatures should be available at all times for

examination by the health officer and others concerned. All animals having a temperature of over 103° F. or showing any other evidence of disease, should be isolated from the milking herd immediately, and no milk from such animal mixed with the market milk supply until such suspects are declared by a licensed veterinarian to show no further evidence of disease.

**6.** Where certain feeds are suspected by the State officials as being contaminated with anthrax organisms, such feed should be embargoed, or otherwise isolated from further use and distribution pending resolution of the doubts concerning the safety of the product. If found to be contaminated with anthrax organisms it either should be rendered free from contamination by a method acceptable to the State livestock sanitary authority, or it should be destroyed in accordance with 2a above. These determinations should be made as quickly as possible to reduce to a minimum, the physical and economic problems involved in embargoes.

It is realized that the livestock sanitary authorities in some States issue a quarantine that bars the movement of all animal products from the premises on which infection with anthrax has occurred, as a precautionary measure against the mechanical transmission of the disease from one premise to another. Therefore, it is imperative that the milk control authorities cooperate with the livestock sanitary authorities of the State concerned.

It is also important that local and State milk control officials, and the State and local livestock disease control officials, maintain close liaison with each other with regard to reporting of anthrax cases and anthrax control measures. This is necessary to provide for the maximum protection of the health of the persons who may have come in contact with infected animals on the farm, as well as for the protection of the milk consumer, and for the economic welfare of the dairy farmer. Persons handling anthrax infected animals, or materials, should be protected by rubber gloves and boots, which can subsequently be decontaminated with chemical disinfectants.

#### **Other Control Measures**

Processing meat animals from infected or quarantined farms should be done in abattoirs or packing plants that are under the supervision of the Federal Meat Inspection Service or a

local meat inspection service where a trained veterinary inspector is on duty. Although the transmission to man of anthrax in meat has never been reported in the United States, the foreign literature has carried numerous reports.

These reports have usually involved raw or semiraw meat products such as hard sausage.

Prevention of occupational anthrax among animal handlers can best be accomplished by health education. The farmer or animal handler must be cautioned against the treatment of sick animals and against attempts to salvage the hide of dead animals. The fact that no human cases occurred among farmers in Ohio can be explained by the farmer's practice of not making any effort to salvage a hog but of burying or burning it. He will skin a cow or horse and feed the carcass to the hogs. However, with the increasing availability of rendering plant pickups of dead animals, this latter practice is disappearing.

On a farm where anthrax is known to be present, the operator should receive instructions either from the attending veterinarian or the health department about how to protect his health. The most important thing to stress is personal hygiene and prompt medical care for any scratches, abrasions, or pimples that may appear.

Animal disease control is primarily the responsibility of the attending veterinarian and the livestock sanitary officials. The success of

antibiotics in the treatment of animal anthrax has provided an excellent weapon to deal with this problem. The live spore vaccines have been used extensively in this country with good results, although sometimes they fail. They should be used only on premises where infection has been proved or where there is strong evidence of disease. The antibiotics may replace the antiserum and bacterins that previously have been used in herds or droves adjacent to infected premises.

### Conclusions

Anthrax is not readily transmitted to man. In the United States there is no report of its transmission to man by meat or milk. During 1951-52 animal anthrax cases increased, especially among swine. Some of these outbreaks were traced to contaminated bonemeal. However, even though there were more animal cases, the human cases continued to decline, and in 1952 numbered less than in 1951. Public health aspects are discussed as they relate to milk, meat, occupational disease, and animal disease control.

## Anthrax Epidemic Curbed In Paraguay

Anthrax was temporarily halted in the country-side surrounding Coronel Oviedo, a town in Paraguay, after a 2-week fight this spring to prevent the spread of the virulent disease to 113,000 beef cattle. More than 1,300 cattle were given anti-anthrax vaccine. A quarantine area for the infected animals was established.

Barricades were erected on roads leading to Coronel Oviedo, and livestock growers taking their cattle to town either submitted them for vaccination or were required to return the animals to their properties. Even cart-drawing oxen were submitted to vaccination. Any slaughtered animals taken to the town for the market were examined by veterinarians for signs of disease.

Eighty head of cattle had died, but no human cases of anthrax had been found, as of April 17, 1953. Anthrax is greatly feared in Paraguay since livestock production is the backbone of the economy and beef cattle total almost 4 animals to each of the country's 1,500,000 population, according to the news report released in April by the Institute of Inter-American Affairs.

The discovery of the sudden death of 40 cattle in Coronel Oviedo on March 14, 1953, brought immediate assistance to the area from the Technical Cooperation Administration offices located 87 miles away in Asuncion. Laboratory analysis of the ear of a dead animal confirmed the outbreak of anthrax, the first for the area in recent years.

# The Interest of Public Health in Diabetes

By MALCOLM J. FORD, M.D., M.P.H.

**I**N DEALING WITH diabetes mellitus, we are dealing with a disease "so widespread as to make public action . . . the only hope for a successful attack" (1). According to the best estimates, some 2,230,000 persons in the United States have diabetes, and only slightly more than half of these people know that they have the disease. Since diabetes occurs more often among older persons, prevalence of the disease, which today is approximately 15 per 1,000 population, can be expected to increase progressively as our older population continues to grow in number.

Mortality data provide two notable facts about diabetes: First, estimates for the year 1951 reveal that diabetes accounted for approximately 25,000 deaths in the United States—only about 5,000 fewer than the number of deaths estimated for tuberculosis (2). Second, diabetes has moved from twenty-first place among causes of death in 1900 to tenth place in 1950 (taking into account changes in classification of cause of death since 1900 and omitting all ill-defined causes).

With the threat of communicable diseases substantially diminished, the growing problem of chronic diseases stands out as the principal challenge and a most urgent responsibility for

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the public health worker. The record of progress against the chronic diseases in the future will be more and more critical in determining the standard of health which we as a Nation shall achieve.

Public health is especially concerned with the prevention of disease—prevention either in the primary sense of preventing the occurrence of the disease, or in the secondary sense of preventing progression of the disease from an early stage to a more severe one.

As is true of many of the chronic diseases, primary prevention of diabetes is as yet an unfulfilled objective. It is now confined to measures suggested by the epidemiology of the disease. The incidence of diabetes is higher among overweight people than among those whose weight is normal or below normal; therefore, discouragement of overweight is in a sense a measure to prevent diabetes. Diabetes appears to run in families; therefore, the advisability of marriage between persons from diabetic families is a question to be considered in terms of preventing the disease. But without more basic knowledge of the cause of diabetes, we cannot depend upon preventing its occurrence.

Secondary prevention of diabetes—preventing the complications which account for a large proportion of the disability and death due to the disease—can, however, be undertaken with definite hope of success. Our broadening knowledge of the nature of diabetes makes feasible an intensive program in which the public health and medical professions can participate. High diabetes morbidity and mortality emphasize the necessity for action.

Case-finding procedures in diabetes are relatively simple and fast, and a variety of tests is

available for this purpose. Of all the chronic diseases, diabetes is one of the easiest to diagnose, and, thanks to insulin and diet, one of the easiest to control in the individual patient, provided the patient understands the relatively simple treatment measures and cooperates fully with his physician.

Diabetes, a condition in which the body's ability to use and store carbohydrates is impaired, is most likely to be found in persons over 40 years of age, in the obese, or in those who have a history of diabetes in the family. Because mild diabetes does not necessarily produce symptoms recognizable to the patient, it may be present for some time before it is discovered. Usually diabetes becomes serious when the diabetic patient does not know of his condition or when, once knowing, he allows his condition to get out of control. Through case-finding programs the diabetic person can be sent to his physician for care while his disease is in an early stage. Under continued medical supervision, he can learn how to remain a contributing member of society.

During the past few years, a definite pattern for diabetes control has been evolving, and activity areas have been staked out: case finding and referral for care, patient and professional education, and education of the general public designed to disseminate the facts and to encourage a positive attitude regarding diabetes.

#### **Community Detection Programs**

The progression of unrecognized and uncontrolled diabetes results all too often in serious complications. The insidious development of the disease calls for aggressive case-finding efforts. For this, community action is needed.

A number of diabetes case-finding programs have been conducted during recent years. Many communities have undertaken urine-testing programs during a special "diabetes week," with varying intensity of campaigns and degree of coverage. In Connecticut, a diabetes detection program has been undertaken each fall since 1948 (3). The program is sponsored by the Connecticut Diabetes Association and the State department of health on a statewide basis. From 1948 through 1951, 55,990 urine

tests were performed, of which 1,503 (or 2.7 percent) were found positive. These persons were referred to their physicians.

In Florida, a continuing statewide program of case finding is now in progress under sponsorship of the State board of health (4). In 1951, a mobile unit did blood sugar tests on 31,334 persons, of whom 411 with possible diabetes were referred to their physicians. Miami, Jacksonville, and Tallahassee have already been screened, and the program is now concentrating in rural areas. A followup study is also in progress. In addition to its diabetes-screening program, Florida has been maintaining a program of insulin distribution to indigent diabetic patients. In 1951, insulin worth more than \$32,000 was given free to 2,555 such patients.

In Georgia, a program of blood-testing for anemia and for abnormalities of carbohydrate metabolism was added in 1949 to the existing health test program for venereal disease and tuberculosis (5). During the past 2 years, over 300,000 persons have been screened for diabetes.

The first blood-sugar screening program in Georgia was conducted in Atlanta in 1950. Statistics for this survey show that 3.3 percent of the population examined had blood-sugar levels above normal. Confirmatory tests were not made on these people; they were referred to their private physicians for final diagnosis. One group of 6 Georgia counties tested in 1951 included 43,543 persons, of whom 55 were previously known diabetic persons, 449 were classified as suspects, and 169 had borderline blood-sugar determinations. These persons, too, were referred to their physicians.

In 1951, diabetes detection was combined with a communitywide chest X-ray survey in Contra Costa County, Calif. (6). Sponsorship of this combined screening program included State and local official and voluntary health agencies and the Public Health Service. A total of 14,681 persons who stated that they did not have diabetes were given the Wilkerson-Heftmann blood-sugar screening test. Results of this primary screening revealed 191 persons with positive tests, a rate of 1.3 percent. A more specific, second blood-sugar screening test reduced the number actually referred to private physicians

to 127. Final diagnostic reports which were received for 102 of these 127 referrals revealed 58 new cases of diabetes, 0.40 percent of the 14,681 participants. In the year following initial screening, glucose tolerance tests were performed on 32 diabetes suspects whose referrals immediately following the survey had resulted in diagnoses of either "not diabetic" or "unknown." Fifteen of them were found to have diabetic glucose tolerance curves, increasing the number of newly discovered diabetic patients to 73. This represents a discovery rate of 0.50 percent among the 14,681 participants in the survey.

These few examples of community detection programs serve to indicate the results to be achieved by such programs. In each instance, many unknowing victims of diabetes were discovered and advised to place themselves under medical care. They have thus been given the opportunity to attain their optimum health.

#### **Education of the Public**

As is true with all case-finding programs, the discovery of new cases of diabetes is not the only benefit which accrues from a diabetes detection program. This activity also provides both the occasion and the opportunity for educating the general public.

The diabetes case-finding survey affords an effective vehicle for the transmission of detailed information about the disease. It can emphasize the need for periodic health examinations as a means of preventing or forestalling many of the difficulties of long-term diabetes. Equally important, it provides the opportunity to impart to the public an understanding of the problems faced by diabetic patients in the management of their disease. Public education on diabetes can prevent the oft-repeated and tragic mistake of arresting on alcoholism charges a diabetic patient in coma or insulin shock.

The case-finding survey can serve as the basis for public support of a public health program for diabetes control. Many medical leaders believe that the concentration of attention on the problem of diabetes in the community leads to improvement in the diagnosis and treatment of the disease.

#### **Patient Education**

In no disease or pathological condition is the education of the patient a more important part of treatment than in diabetes. The patient with newly discovered diabetes faces a period of great adjustment to a new and, at first, psychologically difficult way of life. Here the public health profession can perform a great service by sharing with the physician the task of educating the patient.

Supervision by the physician is essential, but the patient himself has a major responsibility for the control of his disease. Injection of insulin, the following of a diet, a program of exercise, care of the feet, and testing of the urine are all indispensable to successful control of diabetes. Every patient, at least subconsciously, wants to do his job well, but in order for him to do so he must be given special instruction. Public health, with its long experience in health education, can help the physician by giving the diabetic patient the detailed instruction he needs to adjust to and live normally with his disease.

Leading diabetes specialists and clinics treating large numbers of diabetic patients make arrangements for special instruction through individual consultation or formal classes. Diabetes specialists also have written many manuals for the patient's instruction. This type of education, however, does not usually reach the large number of diabetic patients under the care of general practitioners. Here is a distinct opportunity for public health agencies. The wholehearted interest and enthusiasm that can be expected in such classes has been demonstrated in Jacksonville, Fla., Rochester, N. Y., and Boston, Mass.

A number of teaching aids are available for use in group or individual instruction—for example, the widely used kit, "Taking Care of Diabetes," prepared by the American Diabetes Association, the American Dietetic Association, and the Public Health Service. The kit consists of 11 film strips with sound, covering most of the problems the diabetic person faces. There are 12 wall charts, an instructor's guide, a sample set of booklets for the patient, a sample set of meal planning booklets, and a diabetes

guidebook for the physician. The kit is available for preview purposes from the Public Health Service medical directors in regional offices of the Department of Health, Education, and Welfare.

Another excellent teaching aid is the booklet, "Meal Planning With Exchange Lists," prepared by the American Diabetes Association, the American Dietetic Association, and the Public Health Service. This booklet, a recent contribution to the field, standardizes and simplifies the patient's diet. Used under the guidance of a physician, the booklet and lists allow the patient's diet to be adapted from the family menu. It is therefore easier for the patient to accept and follow the prescribed diet.

### Establishing Community Programs

As has been learned from experience in the control of a disease such as tuberculosis, a detection and health education program is greatly strengthened by the cooperation of community organizations and institutions. In setting up a diabetes detection and control program, therefore, it is wise to enlist the cooperation and guidance of the local diabetes association. Encouragement of the formation of local affiliate chapters of the American Diabetes Association where none exist will pay big dividends in the successful operation of the diabetes control program.

Any control program poses problems which each community must solve for itself. In diabetes detection and control, the community must decide, for instance, whether its needs and resources indicate diabetes detection alone, or whether to add diabetes detection to a battery of tests. A community must decide, too, whether its diabetes screening program should involve the entire population or only especially vulnerable groups—persons over 40 years of age, those who are overweight, and relatives of diabetic patients. These are decisions which are best made through joint planning with the

local medical society and, if one exists, the local diabetes association.

Once a community decides on detection as part of its diabetes program, a screening technique must be selected. Examination of both blood and urine for sugar is the most reliable method of detection, but this technique is not always practical when a large-scale program is under way. For mass-testing purposes, blood-sugar analysis appears to be the most productive technique, since many suspects can be missed when urinalysis alone is used. For a relatively small expenditure of funds, special equipment for mass-testing, utilizing the blood-sugar technique, can be put into operation, and a full-scale detection program begun. Technical personnel for such an operation can be trained with relative ease, and needed supplies and materials are readily available and relatively inexpensive.

In the control of diabetes mellitus, the public health agency is both a catalyst and an auxiliary force: a catalyst which speeds up the discovery of all cases of diabetes through community action; an auxiliary force which assists the practicing physician in giving the diabetes patient the detailed information which he needs to control and live with his disease successfully.

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- (2) U. S. National Office of Vital Statistics: Provisional vital statistics for January 1952 with data on cause of death for December 1951. *Monthly Vital Statistic Rep.* 1: 1-8 (Apr. 4, 1952).
- (3) Barrett, H. S.: 55,990 urine tests—So what? *Connecticut Health Bull.* 66: 195-202 (1952).
- (4) What happened in 1951 in preventable diseases? *Florida Health Notes* 44: 126-127 (1952).
- (5) Petrie, L. M.: Bowdoin, C. D., and McLoughlin, C. J.: Voluntary multiple health tests. *J.A.M.A.* 148: 1022-1024 (1952).
- (6) Milmore, B. K., Flanders, H. B., Blum, H. L., and Mills, M.: Screening tests for diabetes detection—combined with a chest X-ray survey. *California Med.* 78: 37-43 (1953).

# Tuberculosis Mortality by State, 1950

FINAL 1950 tuberculosis mortality statistics (by residence) are now available from the National Office of Vital Statistics, Public Health Service, for each State and the District of Columbia. The tuberculosis death rates (all forms) ranged from a low of 6.2 per 100,000 population for Wyoming to a high of 59.6 per 100,000 for Arizona. Four States—Wyoming, Utah, Iowa and Nebraska—had less than 10 deaths per 100,000 population while 6 States—Arkansas, Tennessee, Maryland, Kentucky, New Mexico, and Arizona, and the District of Columbia—had death rates greater than 30 per 100,000.

The overall geographic pattern of tuberculosis mortality for 1950 resembled that for 1949. As shown on the map, the States having highest mortality were confined largely to the south, southwest, and east while the States with the lowest rates were generally those in the northwestern and north central parts of the country.

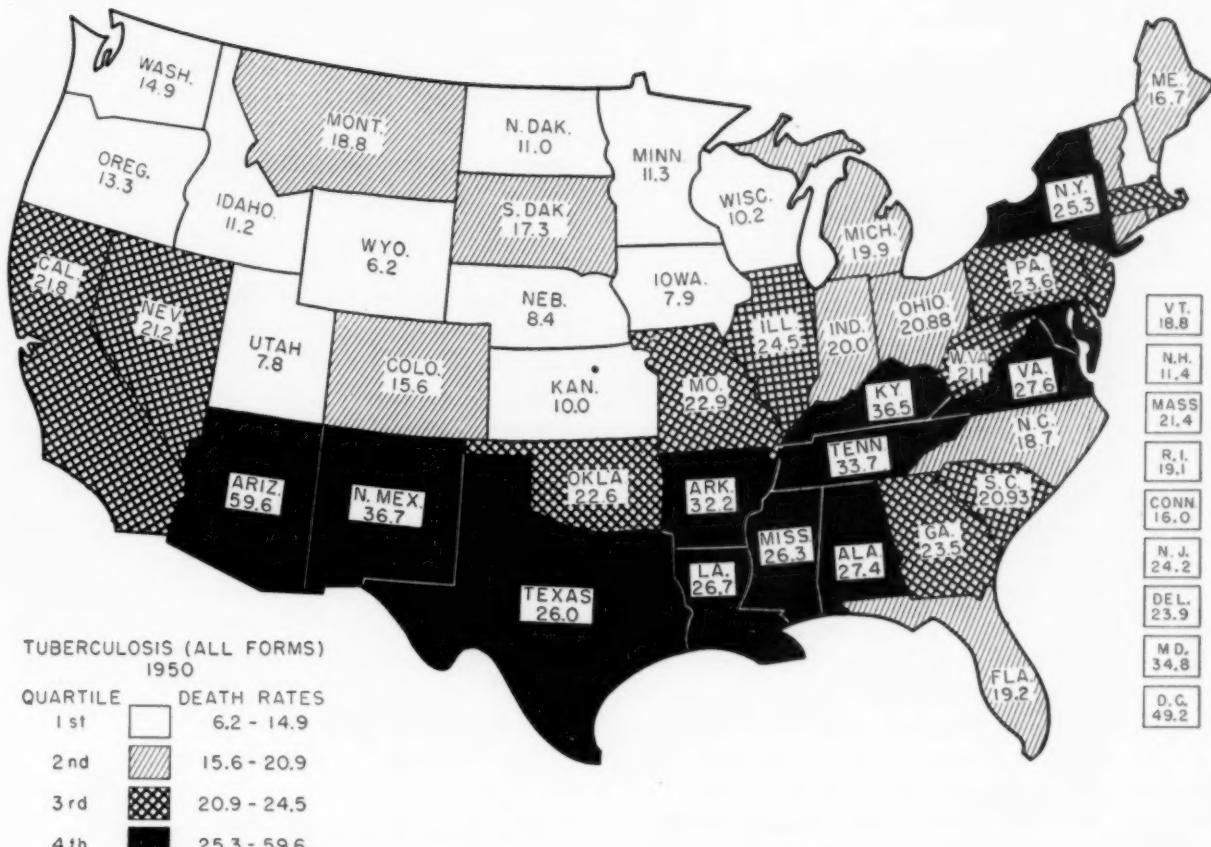
The year 1950 completes a decade of striking reductions in our tuberculosis death rate. For the continental United States, the death rate dropped from an average of 45.8 per 100,000 population for the 3-year period 1939-41 to 22.5 in 1950, a decline of 50.9 percent, whereas in the preceding decade the tuberculosis death rate declined 35.6 percent. All States and the Dis-

## Tuberculosis deaths (all forms) and death rates: United States and each State, 1950

(States ranked by death rate)

Rank	State	Number of tuberculosis deaths	Rate per 100,000 population <sup>1</sup>	Rank	State	Number of tuberculosis deaths	Rate per 100,000 population <sup>1</sup>
	United States	33,959	22.5	25	South Carolina	443	20.9
1	Wyoming	18	6.2	26	West Virginia	424	21.1
2	Utah	54	7.8	27	Nevada	34	21.2
3	Iowa	207	7.9	28	Massachusetts	1,005	21.4
4	Nebraska	111	8.4	29	California	2,312	21.8
5	Kansas	190	10.0	30	Oklahoma	505	22.6
6	Wisconsin	350	10.2	31	Missouri	907	22.9
7	North Dakota	68	11.0	32	Georgia	808	23.5
8	Idaho	66	11.2	33	Pennsylvania	2,474	23.6
9	Minnesota	336	11.3	34	Delaware	76	23.9
10	New Hampshire	61	11.4	35	New Jersey	1,171	24.2
11	Oregon	202	13.3	36	Illinois	2,135	24.5
12	Washington	355	14.9	37	New York	3,759	25.3
13	Colorado	207	15.6	38	Texas	2,006	26.0
14	Connecticut	322	16.0	39	Mississippi	573	26.3
15	Maine	153	16.7	40	Louisiana	717	26.7
16	South Dakota	113	17.3	41	Alabama	838	27.4
17	North Carolina	758	18.7	42	Virginia	917	27.6
18	Montana	111	18.8	43	Arkansas	615	32.2
19	Vermont	71	18.8	44	Tennessee	1,110	33.7
20	Rhode Island	151	19.1	45	Maryland	815	34.8
21	Florida	531	19.2	46	Kentucky	1,075	36.5
22	Michigan	1,268	19.9	47	New Mexico	250	36.7
23	Indiana	786	20.0	48	District of Columbia	395	49.2
24	Ohio	1,659	20.9	49	Arizona	447	59.6

<sup>1</sup> Enumerated population Apr. 1, 1950.



trict of Columbia shared in the general decline, with 7 States—California, Colorado, Florida, Nevada, Washington, Wisconsin, and Wyoming—having declines of 60 percent or better. In Arkansas and the District of Columbia the tuberculosis death rate dropped less than 40 percent.

Although these declines are impressive, the numbers of deaths remain high for a disease whose cause and manner of prevention have been well known for over a half a century.

Furthermore, the decline in the annual num-

ber of new cases of tuberculosis reported during recent years has been slight compared with the decline in mortality. That the number of newly reported cases remains high, despite the rapid decline in death rates, underscores the fact that efforts to wipe out tuberculosis must continue to have high priority among public health problems.

*This report was prepared by the Division of Chronic Disease and Tuberculosis, Public Health Service.*



# Public Health Service Emergency Assistance In Disaster Relief

By GORDON E. McCALLUM, C.E., and  
HARVEY F. LUDWIG, M.S.

The principal public health problems created by natural disasters are due to the breakdown of public health safeguards resulting from damage to, and failure of, certain public works and other facilities and the interruption of public services upon which present-day urban communities have become almost totally dependent. Among examples which can be cited are facilities for maintaining a safe and adequate supply of water; facilities for collecting, treating, and disposing of sewage, garbage, and other community wastes; measures for controlling and protecting against rodents and insects which transmit disease; and procedures for maintaining food and milk free from contamination. Failure of such facilities or services reverts the community to virtually primitive conditions, or worse, because the individual has largely lost his knowledge of how to obtain and purify his own water supply, how to prepare food without fuel, how to dispose of his own wastes, or how to improvise temporary shelter. Unless emergency protective measures are promptly taken, there is great hazard of large-scale epidemics of communicable diseases. The seriousness of such situations is one of the basic reasons for the unique and powerful authority of the health officer in an American State or community.

The role of the Public Health Service at times of disaster is the provision of emergency assistance to stricken areas whenever their resources become taxed to the degree that a request for

outside assistance becomes necessary. The assistance is provided through the State departments of health, as is other assistance by the Service. The Public Health Service has a long record of successfully providing such assistance: the yellow fever epidemic in Hampton, Va., in 1894 and in New Orleans in 1905; the plague outbreaks in San Francisco in 1907 and in New Orleans in 1914 and in 1920; the Mississippi River flood of 1927; the Ohio River flood of 1937; the gulf coast hurricane in 1947; the Texas City disaster of 1947; and the California encephalitis epidemic of 1952. In every instance Public Health Service assistance has simply supplemented, as required, the regular State-community public health operation, in which the community, State, and Federal health officials function as a team on all sorts of problems. Voluntary health agencies have also aided in emergency activities, with the result that over the years a close collaboration has evolved between the Public Health Service and the American National Red Cross on the handling of emergency health problems.

## Policies Governing Emergency Activities

In carrying out its emergency assistance activities, the Public Health Service makes available to the States its regular resources of professional personnel, hospitals, equipment, and supplies. Under extreme conditions it can arrange additional assistance through utilization of the Reserve Corps, by which needed specialists from outside the Government can be quickly mobilized and deployed to the sites of need.

The Public Health Service also has traditionally utilized its offices to help mobilize resources from outside the regular health agencies. Through the continuing contacts of its personnel with their professional counterparts in other government agencies, military and civilian, and in voluntary and private institutions and organizations, the Public Health Service is peculiarly able to render this type of assistance.

## The Kansas-Missouri Flood

The Public Health Service's participation in emergency assistance during the Kansas-Mis-

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*Mr. McCallum is chief of health emergency planning, Office of the Surgeon General, Public Health Service. Mr. Ludwig is consultant for sanitary engineering on the health emergency planning staff.*

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souri flood in the summer of 1951 was typical. When it became evident that a flood of disaster proportions was impending, the Surgeon General designated the Public Health Service regional medical director at Kansas City to supervise and coordinate Public Health Service activities. At the same time, the Communicable Disease Center dispatched necessary technicians and equipment to the flood area from various Communicable Disease Center field offices as well as from its headquarters at Atlanta. Technicians were made available also from the Public Health Service Missouri Drainage Basin Office and from miscellaneous other Public Health Service stations. During the period of the flood peak, some 70 Public Health Service specialists were assigned to duty in the flood area at the request of State health officials, including 3 medical officers, 23 sanitary engineers, 15 entomologists and other scientists, and 19 sanitarians. The work which they performed comprised emergency measures undertaken during the flood-peak period plus rehabilitation activities as the flood receded.

#### *Emergency Measures*

Of particular importance during the emergency was assistance in the restoration and maintenance of safe public water supplies. Portable water filtration and chlorinating equipment, some of which was flown into the area, was placed into use in communities where the normal water supplies had been temporarily inactivated, for example, at Ottawa, Kans., where the water supply plant was flooded out, and at Indian Creek in Johnson County, Kans., where the normal source of supply delivered from Kansas City had been interrupted. In other places, flooded pumping plants were dewatered and restored to service, and mains were disinfected with chlorine to eliminate contamination. Disinfecting chlorine compounds were furnished to residents in communities served by wells which had become flooded, for temporary use while the wells were being pumped out, sterilized, and returned to service. Arrangements were worked out with chlorine manufacturers to permit prompt shipment of extra supplies of liquid chlorine to the area had this become necessary. Special laboratory tests

were made—for example, at the Lawrence (Kans.) State Laboratory—to guide the work and to insure the continued safety of water supplies which had been subjected to contamination. Considerable work was also done in reactivating interrupted sewage disposal works, including pumping plants, to prevent further contamination of water supplies.

Other work accomplished during the emergency period included assistance in the maintenance of safe food and milk supplies at evacuation centers, furnishing and distributing medical supplies, including vaccines, and careful epidemiological surveillance to detect possible outbreaks of epidemics.

#### *Rehabilitation Activities*

The recession of the flood waters increased rather than decreased the scope of the environmental sanitation activities. A large number of Public Health Service personnel worked over a prolonged period in controlling insect breeding and nuisances. This work required the use of much insecticide spraying equipment and large supplies of DDT, chlordan, oil, and other insecticides, some of which were delivered to the area by air transport. Initial emphasis was placed on fly control to prevent the possible spread of diseases such as typhoid and dysentery; and later emphasis, on mosquito control to assist local authorities in preventing an abnormal incidence of potential disease vectors. Entomological experts supervised the work after making on-the-spot surveys to determine what control measures would be most effective.

Another important problem facing local health authorities was the disposal of approximately 12,000 dead animals. This was accomplished principally by hauling the animals by truck to landfills for disposal by burial. Inspection of milk and food supplies was expanded to check all sources which had been subjected to contamination or spoilage, and to release only those products safe for consumption. Special measures were also taken to reinforce the normal rodent control programs of the flooded communities. Special checks of rat populations were made and rat poisons applied in those zones where rat populations were increasing because of migration or extraordinary exposure of food supplies. The importance of

these various continuing activities is indicated by the fact that 1 month after the flood peak several of the Public Health Service technicians were still on the job.

No abnormal incidence of any communicable disease was reported for any community in the area.

#### **Legislative Authority**

Authority for Public Health Service activities in assisting States at times of emergency is included in its authority for assisting States generally. Emergency assistance is customarily provided through the loan of specifically qualified personnel on State request under section 214 of the Public Health Service Act (Public Law 410, 78th Cong.).

More generally, section 311 of this act directs the Surgeon General to assist States and their political subdivisions in the prevention and suppression of communicable diseases and in the enforcement of local health regulations; also, the Interstate Quarantine Regulations of the Service, issued under section 361 of the act, authorize the Surgeon General to take special measures to prevent the interstate spread of the more important communicable diseases.

In the event of emergency or disaster, the President, under section 216 of the Public Health Service Act or under the Disaster Relief Act of 1950 (Public Law 875, 81st Cong.) may direct the utilization of the specialized personnel, equipment, and other facilities of the Service.

#### **Financing Emergency Assistance**

The Public Health Service has available, in the amount of \$40,000 annually, a special disaster and epidemic control fund, which is administered within the Communicable Disease Center of the Public Health Service. In years when one or more major disasters occur, especially disasters such as floods which create relatively great public health problems, this sum has not been adequate to meet the needs. In every instance, however, the Public Health Service has responded to requests from States to furnish at least the bare minimum of assistance necessary to prevent epidemics. Whenever necessary the Public Health Service has, with proper authority, utilized resources from regular operating programs—the emergency needs of States being given special priority in the sense that the prevention of mass epidemics is a Service function of the very highest importance.

Enactment of the Disaster Relief Act makes it possible for additional funds to be made available to finance Public Health Service emergency operations. The availability of such funds constitutes a kind of "insurance" and should make possible the undertaking of all essential emergency relief operations with a minimum of apprehension as to effects on regular program operations. And most important, the availability of funds through this act, in the form of grants to stricken communities will expedite their own recovery activities; thus the conditions which create major health hazards may be more quickly corrected.



# A Preventive Medicine Screening Program in a Venereal Disease Clinic

By GERALD J. GRUMAN, M.D.

Many patients seen at the State of Kentucky Prevention and Control Center are discovered to have other health problems besides the venereal disease for which they were referred. In the past these patients were dealt with on an informal basis. However, the staff lately has attempted to organize this side of its work into a formal program of preventive medicine. The program costs nothing extra.

Each patient (other than those diagnosed as having gonorrhea) is given a thorough physical examination. This includes: funduscopic examination; breast, pelvic, and rectal examinations in all women; and rectal examination in all men over forty. Each patient presenting an emotional problem is given a 30-minute interview when it is possible. If this procedure reveals the need for diagnosis or treatment of nonvenereal conditions, the patient is referred to a public or private facility. The patient is given a sealed letter describing his venereal disease status and reasons for referral.

Frequently we discover neglected nonvenereal problems in gonorrhea patients. With our present facilities it is impracticable to do a complete physical examination on each gonorrhea patient. Therefore, our data on gonorrhea patients are not included in this report.

A study of records for 2 months reveals that 259 nongonorrhea patients have been seen in the clinic and have received the physical examination described above. The examination of these 259 patients revealed the presence of a neglected nonvenereal condition in 50 patients (19 percent).

The suspicion of cancer in most cases was aroused by the presence of nodules or masses in the breast, prostate, cervix, uterus, or ab-

domen. The urologic conditions were mostly nongonorrheal prostatitis. The psychiatric problems were related to sexual impotence, homosexuality, or syphilophobia. The skin conditions were venereal warts, scabies, and contact dermatitis. The eye conditions were refractive error and ptterygium. The gynecologic conditions were prolapse of the uterus and monilial vaginitis. The neurological conditions were polyneuritis and epilepsy. The vocational rehabilitation problems were related to blindness and neuromuscular disability following trauma. The other conditions included precocious puberty, peptic ulcer, respiratory infections, and perineal abscesses.

<i>Nonvenereal conditions</i>	<i>Patients</i>
Suspicion of cancer	19
Urologic	6
Psychiatric	5
Skin	4
Eye	2
Gynecologic	2
Neurological	2
Vocational rehabilitation problems	2
Others	8

By systematizing the nonvenereal aspects of our work, we have been enabled to see a definite pattern. Certain gaps are revealed which suggest amendments to the original plan. For example, with very little trouble, we could give dental referral slips to patients with caries. (Nearly 100 percent of our patients reveal signs of poor dental hygiene.) We could refer many youngsters for circumcision. Our vocational rehabilitation work readily could be expanded.

The diagnosis and treatment of venereal disease is being done more and more by small prevention and control centers like ours. The results of our program give an interesting indication of what can be accomplished by such a small staff dealing with patients on an outpatient basis only. We do not have any laboratory facilities for X-rays or urinalyses. Yet, a thorough history and physical examination of 259 patients were enough to reveal to us more nonvenereal health problems than we could possibly handle.

The records reveal another interesting situation: Of the 50 patients described above, 40 were referred to private practitioners of their own choice, and 10 were referred to public facilities. Thus 16 percent of all the patients ex-

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*Dr. Gruman is a commissioned officer of the Public Health Service. He is now stationed at the State of Kentucky Prevention and Control Center, Louisville.*

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amined in our public clinic were referred to private practitioners because of nonvenereal conditions.

The reporting of these patients with our letters of referral is creating an increased feeling of good will among the private practitioners towards the venereal disease clinic. Also, the appearance of the patient with his letter is a means of acquainting the private physicians

and the community health and welfare personnel with the fact that a venereal disease clinic exists and performs various important functions. Thus, by carrying on a preventive medicine screening program in a systematic manner, a specialized clinic is helping to create that organic network of interrelated services and that climate of good will and cooperation so necessary to the community's public health system.

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### **Dr. Candau Appointed WHO Director-General**

Dr. M. G. Candau of Rio de Janeiro, Brazil, was appointed Director-General of the World Health Organization by the Sixth World Health Assembly on May 11, 1953. Dr. Candau, who will serve for a 5-year term beginning July 22, 1953, succeeds Dr. Brock Chisholm. Dr. Candau is presently deputy director of the Pan American Sanitary Bureau, Washington, D. C., the regional office for the Americas of the World Health Organization.

The Sixth World Health Assembly convened at Geneva, Switzerland, on May 5, 1953. The World Health Assembly is the supreme legislative body of the World Health Organization and meets once each year. A 16-member delegation represented the United States at the Assembly. Surgeon General Leonard A. Scheele of the Public Health Service was the chief delegate and chairman of the United States delegation. Other members included—

Delegates: Leonard W. Larson, M.D., member, Board of Trustees, American Medical Association, Bismarck, N. Dak., and Franklin D. Murphy, M.D., chancellor, University of Kansas.

Alternate delegates: Henry van Zile Hyde, M.D., and Frederick J. Brady, M.D., respectively chief and international health representative of the Division of International Health, Bureau of State Services, Public Health Service; also, Howard B. Calderwood, specialist in international organization, Office of United Nations Economic and Social Affairs, Department of State.

Congressional advisers: Congressman Homer D. Angell of Portland, Oreg., and Congressman Wayne L. Hays of Flushing, Ohio.

Advisers: Knud Stowman, Ph.D., international health representative, Division of International Health, Bureau of State Services, Public Health Service; Robert T. Stormont, M.D., secretary, Council on Pharmacy and Chemistry, American Medical Association, Chicago; Carl N. Neupert, M.D., State health officer, Wisconsin State Board of Health, Madison; Col. Thomas F. Whayne, MC, USA, chief of preventive medicine, Department of the Army; Ruth Sleeper, director, School of Nursing and Nursing Services, Massachusetts General Hospital, Boston; and Carol C. Laise, Division of International Administration, Department of State.

Henry F. Nichol was secretary and Mason A. LaSelle was administrative officer of the delegation. Both are with the Resident United States Delegation for International Organization Affairs at Geneva.

## **Oral Manifestations of Occupational Origin**

The purpose of this compilation, the foreword states, is to bring together information relating to oral conditions which are associated with occupations, to make such material more readily available to dentists and other interested persons or groups.

The articles are arranged according to category of exposure, namely, acids, bacteria, dusts, gases, inorganic substances, metals, organic compounds, and physical factors. Articles referring to several types of exposure are classified under "General Review." Occupational cancer has been placed in a separate category. The types of exposure within each category are listed alphabetically. In those instances where more than one article is presented for a specific exposure, the listing is in reverse chronological order with the more recent articles appearing first. Numbers following listed headings refer to item numbers, which run consecutively throughout the publication. An author index follows the abstracts.

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Walters, F. J., Fridl, J. W., Nelson, R. L., and Trost, J. W.: *Oral Manifestations of Occupational Origin—An Annotated Bibliography*. Public Health Bibliography Series No. 7 (Public Health Service Publication No. 228). 41 pages. 20 cents.

## **Guide to Health Organization in the United States**

A panoramic view of the entire health structure of our Nation is contained in this pamphlet, the preface states. The authors point to the contributions of Federal, State, and local official and voluntary agencies, and of private physicians, dentists, and nurses. The salient functions of the many agencies which

give health services in the United States are brought together in a simple brief form.

The pamphlet, first issued in 1946 and reprinted in 1948 and 1950, as "Guide to Health Organization in the United States—Miscellaneous Publication No. 35," has been used widely in orienting professional public health workers, visitors from other countries, and American students to the multiple systems of health service. It has also proved to be a concise and readable source of information for the general public.

Because of the substantial changes which have taken place during the past 5 years—both in content and in organization of public health services—the "Guide" has been revised in this second edition to reflect the public health picture of 1951. Substantive changes have been restricted to those necessary to bring the material up to date and those indicated by experience in using the first edition. To guide those who wish a more detailed and comprehensive grasp of the organization and administration of health services, an extensive bibliography is appended.

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Mountin, J. W., and Flook, E.: *Guide to Health Organization in the United States*. (Public Health Service Publication No. 196) 1953. 104 pages; charts; tables. 30 cents.

## **National Heart Institute**

Text, charts, statistics, and photographs tell the story of the programs and work of the National Heart Institute which was created under the National Heart Act of June 16, 1948. Twin goals of the heart program are: (1) to find new and better ways of preventing, diagnosing, treating, and curing heart disease, and (2) to see that what is already known (and what is discovered by research) is fully applied to reduce death, disability, and suffering caused by heart disease. Funds are appropriated by the Congress to carry out the work of the National

Heart Institute and are allocated for National Heart Institute research; research grants; research fellowships; clinical traineeships; teaching grants; control grants to States; technical assistance in control; review and approval of grants; and program direction and administration.

The National Heart Institute, a part of the National Institutes of Health, Public Health Service, conducts an integrated program of research in its own laboratories and in cooperating institutions. The grants for medical research are made to universities and hospitals all over the country; to individual scientists to carry out important heart disease research projects; for construction of additional vitally needed research facilities; and for specialized training in cardiovascular diseases. The research fellowships program helps to relieve the scarcity of well-trained scientists in the heart disease field; and clinical traineeships are available to doctors under 40 years of age who have completed a year's general internship and an additional year of training and experience. Teaching grants make it possible for medical schools to coordinate and improve instruction in subjects on heart disease, and technical assistance provided through the heart section of the Division of Chronic Disease and Tuberculosis of the Public Health Service aids the States in technical matters relating to heart disease control measures. Pilot studies are conducted to determine the best methods and techniques for developing and operating a community heart program. These are actual field demonstrations in heart disease control, carried out in cooperation with State and local health departments and medical societies.

The inside front cover of this booklet quotes the purpose of the National Heart Act, and the inside back cover shows a chart of the structure of the Public Health Service heart program.

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National Heart Institute. (Public Health Service Publication No. 241) 1953. 24 pages; illustrations. 15 cents.

### **A Draft Act Governing Hospitalization Of the Mentally Ill**

From time to time, State officials, lawyers, judges, and members of the medical profession have suggested the need for a model statute incorporating widely accepted concepts of legal and medical procedure for hospitalizing the mentally ill. In response to this need, and in view of the interest shown by the State governors at their annual conferences, the National Advisory Mental Health Council requested the Federal Security Agency to prepare a draft of such legislation. A working committee, staffed by medical and legal representatives of the National Institute of Mental Health, St. Elizabeths Hospital, and the Office of General Counsel, assisted by a special consultant, formulated the work that is known as *A Draft Act Governing the Hospitalization of the Mentally Ill*. Some 40 outside medical and legal authorities were consulted for their views during the planning period. In September 1950, a draft of the suggested legislation was transmitted to all of the State governors.

In brief, the legislation proceeds on the philosophy that the mentally ill are sick persons and that society, in depriving them of their freedom, is obligated to assure that procedures for their hospitalization, particularly those individuals whose condition renders them incapable of making decisions, should be surrounded by equitable safeguards. Under the provisions of the suggested legislation, the mentally ill would be spared public humiliation, degrading or emotionally harmful treatment, and their commitment would be free of any penal connotations. Restrictive obstacles to prompt medical care would be removed through provisions in the legislation for permitting voluntary admission upon medical certification.

In September 1952, certain portions of the text, and, in some cases, the terminology, were revised to strengthen the original concepts of the legislation and to clarify the language where it might be ambiguously interpreted. The revision was completed after intensive review and discussion of the proposed changes by the original working committee. In this work, the committee exchanged views with medical and legal authorities of the National Association for Mental Health, Inc., a voluntary, non-profit organization. Two very important changes in the revised edition are the clarification of the basic criteria for identifying individuals in need of hospitalization and procedures covering the admission of individuals in emergency medical situations. Among the other revisions are several that emphasize the importance of assisting the patient to maintain his morale during hospitalization and subsequent convalescence.

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**A Draft Act Governing Hospitalization of the Mentally Ill.** (Public Health Service Publication No. 51). Revised 1952. 36 pages. 15 cents.

### **Directory of Full-Time Local Health Units—1952**

Revised as of July 1952, this directory contains a listing of full-time health units serving local areas, together with the name of the health officer of each unit or other designated administrative head, and headquarters location.

A full-time health unit is one officially organized to provide medical, nursing, and sanitation public health services during the regularly scheduled work week of the governmental unit to which it is attached and which is under the direction of a full-time health officer or other designated full-time administrative head.

The information is arranged alphabetically by State and by type of health organization: local units (county, city, and local district) and

State districts (either rendering actual local services or providing supervisory and advisory services).

The number of full-time units rendering local health service with the number of counties served, and the full-time units with the position of health officer vacant or temporarily filled by a neighboring health officer are summarized in the appendixes.

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**Directory of Full-Time Local Health Units—1952.** (Public Health Service Publication No. 118) 1952 revision. 63 pages. 25 cents.

### **Help Fight Pollution Now**

Designed for display at State fairs, conventions, conferences, libraries, and other places, this five-color 3- by 4-foot poster stresses the necessity of the abatement of water pollution and the conservation of our water resources for home use, industry, agriculture, and recreation. It also has been used as the central panel of a larger exhibit which points out the responsibility of the community and of industry in preventing water pollution (see the November 1952 issue, *Public Health Reports*, p. 1087). The poster shows in one corner a desert scene with the whitened bones of an animal beside a dry water hole. This picture bears the legend, "Polluted water is almost as bad as no water." The central portion pictures a stream being polluted by industrial waste from factories on its banks. A banner across the center states, "Clean up water for . . ." and points to a series of five pictures showing water uses. The words, "Help Fight Pollution Now" appear across the bottom of the poster.

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**Help Fight Pollution Now.** (Public Health Service Poster No. 5) 1952. 3' x 4', colored. Available upon request from the Division of Water Pollution Control, Public Health Service, Washington 25, D. C. For sale in quantity by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 25 cents each.

## Achievements in Public Health

July 1, 1951-June 30, 1952

PROGRESS in the field of public health during the fiscal year 1952, as reflected through the activities of the Public Health Service, is delineated in some detail in the eightieth Annual Report of the Service. Continued success in controlling acute communicable diseases, the opening of new fields of knowledge through research, expansion of the Nation's network of hospitals, and intensification and broadening of State and local health activities are salient among the accomplishments noted. The Public Health Service, in partnership with State and local health departments and in cooperation with other health agencies and organizations, has contributed much to these, as well as many other, achievements of the year.

### Health Status

In 1951, for the fourth consecutive year, the death rate was below 10 per 1,000 population. Death rates from infectious diseases have continued the steep descent which began in 1900. The tuberculosis death rate was at a record low of 19 per 100,000 population; the rate for syphilis was 5 per 100,000; and the combined death rate for the principal communicable diseases of childhood was less than 2 per 100,000. Chronic diseases, first claiming their place as chief causes of death in 1914, today represent the greatest challenge in health. Adequate prevention of these diseases will require intensive efforts of all members of the health professions.

### Medical Research

The immediate program of expansion in organization, in facilities, and in scope of activity

which began in 1948 for the National Institutes of Health, the center of the Service's medical research activities, neared completion in fiscal 1952. A milestone in this record of progress will be the opening of the Public Health Service Clinical Center in 1953. The Clinical Center will provide unique facilities for the medical practice-medical research-public health team to coordinate the study of chronic and crippling diseases.

The past year has also witnessed valuable contributions to medicine and public health by scientists in all seven of the Institutes as well as by many nongovernmental scientists in universities, hospitals, and other research institutions who have been aided through research grants and fellowships. The Annual Report describes a number of the research findings of the year.

### Public Health Resources

With conservation a basic principle, the Public Health Service is contributing to the expansion of the Nation's health resources and at the same time providing important advisory and technical assistance in the endeavors of our health organizations to make maximum use of existing resources in personnel, facilities, and materials.

Acting as claimant for the Controlled Materials Plan, which went into effect July 7, 1951, the Service played an important part in sustaining health facility construction. Facilities estimated at \$781,000,000 were added to the Nation's health resources in fiscal 1952, setting a new high mark in civilian construction. Through the Public Health Service, Federal funds for loans or grants were made available for construction of various community health

facilities in critical defense housing areas and for hospital construction throughout the Nation. The Service also provided information and consultation on many problems of hospital operation, health manpower utilization, and hygiene of housing. Studies of the prevalence and severity of disabling illness were undertaken as part of the Service's contributions to the conservation of manpower resources of the Nation.

### Health Services

Helping States and communities discharge their responsibilities for the maintenance and improvement of health is one of the major jobs of the Public Health Service. Centered in the Bureau of State Services, assistance includes both grants of funds and direct Federal technical services. These include collection and analysis of health data, consultation on specific problems, and field studies and demonstrations to develop and test new methods.

Grant-in-aid payments made in fiscal 1952 amounted to \$31,626,412. Technical, investigative, and consultative assistance in the form of surveys and studies, case-finding projects, laboratory services, training services, and program planning and development was provided in the fields of health education, public health nursing, environmental health, occupational health, disease prevention control, and dental health.

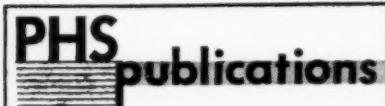
The Public Health Service also provides, as directed by law, medical and hospital care for specific groups, including merchant seamen. Over 500,000 beneficiaries received treatment

during the year at the 22 hospitals, 19 outpatient clinics, and more than 100 outpatient offices of the Service. In addition, the Service assigns health personnel to other Federal agencies to aid them in carrying out their health programs: Office of Vocational Rehabilitation, Bureau of Employees' Compensation, Bureau of Prisons, United States Coast Guard, Maritime Administration, Bureau of Indian Affairs, and the Department of State.

### World Health

By the assignment of public health experts to the technical assistance missions sponsored by the Mutual Security Agency and the Technical Cooperation Administration, the Public Health Service plays a leading role in developing and operating health programs of these missions. During 1952, such programs were in operation in 16 countries—Burma, Formosa, Greece, Indochina, Indonesia, Philippines, Thailand, Turkey, India, Iran, Iraq, Israel, Jordan, Lebanon, Liberia, and Libya—and plans were developed for establishment of programs in 14 other countries. The Service also continued to serve as official liaison with the World Health Organization and the Pan-American Sanitary Bureau. The Surgeon General was president of the Fifth World Health Assembly, which met in May 1952.

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Annual Report of the Public Health Service, Federal Security Agency, 1952. 89 pages. Price 30 cents.



### Rabies

A leaflet on rabies warns that this disease is widespread among animals in the United States and in recent years has been on the increase. Rabies affects the nervous system, including the brain and

spinal cord, of animals and man, and once developed, it is always fatal.

The virus causing rabies may be transmitted by the bite of an infected animal if the saliva of the infected animal comes in contact with an open wound. All warm-blooded animals may contract the disease and spread it. Recently foxes have showed an increase in rabies incidence. Dog bites account for 90 percent of the human cases of rabies in the United States.

The leaflet describes two types of rabies, symptoms of each type, incubation periods, and the progression of the disease in humans and in animals. It tells what to do with a dog suspected of being rabid. It offers pointers for preventing rabies and stresses them because the disease cannot be cured.

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Rabies. Health Information Series No. 30 (Public Health Service Publication No. 97) 1952. 2-fold leaflet. \$1.50 per 100.

## 2d Conference of Mental Hospital Administrators and Statisticians—Proceedings

To assess accomplishments of activities of State mental hospital statistics, comparable statistics on patients treated in such systems are needed. At present, the kinds of data produced by the different States lack uniformity and comparability.

At the Second Annual Conference of Mental Hospital Administrators and Statisticians, called by the National Institute of Mental Health of the Public Health Service on February 25-27, 1952, some of the many problems of standardization of reporting which were discussed dealt with definitions, nomenclature, and tabulations. Conferees represented the 11 States grouped into a model reporting area for mental hospital statistics at a first conference in 1951. These States are: Arkansas, California, Illinois, Louisiana, Michigan, Nebraska, New Jersey, New York, Ohio, Pennsylvania, and Virginia.

In mental hospital systems there is lack of uniformity in definition of terms, such as first admission, resident patient, transfer, and so forth, used to describe the movement of patients into and out of the hospital. For example, in some States, first admissions relate to a particular State hospital; in other States to a particular State hospital system; in still others to any State hospital system; and in the remainder to treatment for mental disorder anywhere.

Comparable data are not always available in different States even on such basic items as length of hospitalization of discharged mental patients by diagnosis, age, sex, and other factors. Methods used for analyzing data have not always been appropriate to the long-term nature of mental illness. These and other difficulties have made it impossible, according to Dr. Morton Kramer, chief of the biometrics branch of the National Institute of Mental Health and chairman of the 1952 conference, to demonstrate satisfactorily the accomplishments or failures in treating the mentally ill.

In a foreword to the published proceedings of the second conference, Dr. R. H. Felix, director of the National Institute of Mental Health, expressed the hope that the progressive thinking of the 11 States will stimulate other States to develop and expand their statistical offices and to collect and tabulate data in a uniform manner so as to meet the standards for inclusion in the model reporting area. At the conference, it was generally agreed that to meet the minimum requirements for inclusion, a State should have a central statistical system supervised by a professional statistician, should agree to the definitions adopted by the model area, and should agree to produce annually the minimum number and type of tables agreed upon by the model area States.

Conferees agreed on definitions for first admission and resident population. They also agreed to exchange ideas concerning needed data; to permit a review of their States' programs of statistics and research in mental hospitals; to develop an effective system of statistical reporting to the National Institute of Mental Health; to continue to form the nucleus of a model area; and to urge the extension of uniform reporting methods to all States.

Included in the 13 appendixes to the proceedings are tables comparing data on first admissions in New York State in 1914 with 7 other States in 1948; a study on services and treatment facilities for mental patients in general hospitals; a study on discharges from the psychiatric division at Bellevue Hospital, New York City; a plan for a census of patients in mental institutions on a cyclical basis; a paper on standard control groups for the evaluation of therapy; and another on suggested cohort studies of first admissions.

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Proceedings of the Second Conference of Mental Hospital Administrators and Statisticians. (Public Health Service Publication No. 266) 1953. 77 pages; appendixes; tables. 40 cents.

## Salaries of State Public Health Workers

This study, the sixth of a series of annual studies of salaries paid to selected classifications of personnel employed by State health departments, includes full-time professional personnel—medical, nursing, sanitary engineering, sanitation, nutrition, health education, statistical, laboratory, business management, dental, and veterinary. The data were obtained from State health department payrolls for August 1952.

Information on salaries paid State health officers, five selected nonmedical program directors, and personnel in the occupational groups listed above is presented by bar graphs. For the convenience of those desiring more detailed information, tables showing salary distribution by States are included for all of these occupational groups except business management officers, health educators, nutritionists, and statisticians.

General salary increases between August 1950, August 1951, and August 1952 are shown for nine occupational groups. For these nine groups the average percentage increase in the lower limits of the salary intervals in which the median appeared was approximately 6.5 percent. Two occupational groups, dentists and veterinarians, were added to the study this year. The salary intervals within the median salaries which appeared in 1950, 1951, and 1952, and the percentage changes in the lower limits of the salary intervals in which the median appeared in 1947, 1948, 1949, 1950, 1951, and 1952 are shown by tabular listings.

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Salaries of State Public Health Workers, August 1952. (Public Health Service Publication No. 260) 1952. 52 pages. Prepared in cooperation with the Association of State and Territorial Health Officers and the American Public Health Association. A limited number of copies available from the Division of State Grants, Public Health Service, Washington 25, D. C.

## Diphtheria

Diphtheria, a dangerous disease, can be prevented. Knowing something of what diphtheria is like will help one to understand why it is important to guard against it. This leaflet tells of diphtheria epidemics as late as the 1880's, and of the protection of inoculation which has resulted in far fewer deaths from this disease now. What diphtheria is like, how the germs behave, how the disease gets around, and how to stop it before it starts are explained. Emphasis is placed on immunization for every baby and when to call the doctor.

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Diphtheria. Health Information Series No. 37 (Public Health Service Publication No. 60) 1953. 2-fold leaflet. \$1.50 per 100.

## Louse Infestation

Lack of personal cleanliness is one of the most common predisposing causes of infestation with the three varieties of body lice discussed in this health information leaflet. The leaflet describes the head louse, the body louse, and the pubic or crab louse, and the manner in which their presence is detected. Consultation with a physician is advised for proper treatment, and scrupulous care and cleanliness for the prevention of the recurrence of the lice.

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Louse Infestation. Health Information Series No. 26 (Public Health Service Publication No. 103). Revised 1952. 1-fold leaflet. 5 cents; \$1.50 per 100.

## Hypertension

Only a doctor can tell by physical examination whether you have high blood pressure, and whether it's serious enough to need attention. People who worry too much over unsolved problem are often susceptible. Heredity is probably a factor, and the condition occurs most often

in persons between 30 and 50 years of age. High blood pressure, or hypertension, is a common disorder which shows up in the heart and blood vessels. In itself, high blood pressure is not a disease, but a sign of something wrong. If blood pressure remains consistently high for a long period of time, however, it can result in serious damage to the heart, the kidneys, and other organs of the body.

There are undoubtedly millions of persons in the United States who have high blood pressure and don't know they have it. Headaches and dizziness may be symptoms, but can be symptoms of other conditions, or there may be no symptoms at all. One can have high blood pressure without being ill or in danger of a sudden breakdown of the heart or arteries.

These statements are made with others in this health information leaflet to explain to the person who may have high or low blood pressure the need to get under a doctor's care and follow a few simple rules for moderate living so that he may be able to continue to work and enjoy life.

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Hypertension. Health Information Series No. 69. (Public Health Service Publication No. 146) 1952. 2-fold leaflet. \$1.25 per 100 copies.

## Trichinosis

The major emphasis in this health information leaflet is on the fact that trichinosis, caused by eating raw or insufficiently cooked pork, is preventable. Pork is a wholesome, flavorful food, and there is no reason why it should not be a part of the diet, but it must be cooked thoroughly.

The leaflet explains how long meat should be cooked and how it can be tested to see if it is done. Some processed meats are treated to kill the trichinae, and the reader is advised to look for the stamp which indicates that the meat has been federally inspected and passed. Another means of prevention which is discussed is the cooking of garbage that is fed to hogs.

The leaflet also contains information on the way in which the trichinae affect the body, the symptoms of the disease, and the forms of treatment.

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Trichinosis. Health Information Series, No. 47 (Public Health Service Publication No. 101) reprinted 1952. 2-fold leaflet. 5 cents; \$1.00 per 100 copies.

## Tularemia

*Bacterium tularensis* produces in certain infected animals peculiar spots in the spleen, liver, and bone marrow, with enlargement of and abscess formation in the lymph glands. This disease, tularemia, man acquires through the handling of dead animals, or by eating the undercooked flesh of an infected animal, or by being bitten by an insect which has previously fed on a diseased animal. The commonest history of a human case is that of the person who has handled the carcass of an infected rabbit. This leaflet states that prevention of tularemia is almost entirely a matter of personal precaution and tells how to take such precautions.

The mode of infection is briefly described, as is the incubation period of the disease. Diagnosis can be aided by certain tests, the leaflet states. Streptomycin has been employed and found to be of great value in the treatment of tularemia when used early in the course of the disease.

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Tularemia. Health Information Series No. 44 (Public Health Service Publication No. 135) 1-fold leaflet. \$1.25 per 100.

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Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication (including its Public Health Service publication number). Single copies of most Public Health Service publications can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.